

# Hazardous Waste...

# *The Basics*

A Resource for Small and Medium Sized  
Businesses in Orange County



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# Hazardous Waste... The Basics

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# Hazardous Waste... The Basics

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# Dedication

We respectfully dedicate this manual to the memory of the late Robert E. Merryman, Director of the Environmental Health Division, tireless champion of public health and safety, and an inspiration to us all.

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# Hazardous Waste... The Basics

## Foreword

The purpose of this manual is to provide the reader with a quick and simple reference regarding hazardous waste. It covers basic concepts that businesses generating, or storing hazardous waste need to know.

Hazardous waste must be handled, stored, transported, treated, and disposed according to mandated laws and regulations. State laws are found in the California Health & Safety Code (referred to as “H&SC” in this guide), Chapter 6.5, while state regulations are found in the California Code of Regulations (referred to as “CCR” in this guide), Title 22. Since laws and regulations are constantly changing, we urge you to review their actual text when you need detailed information. Forms for ordering your own copy of the law and regulations, and locations of local law libraries, are provided in Appendices A and B.

The Environmental Health Division is committed to protecting public health and the environment. We implement the hazardous waste and the underground storage tank programs to ensure that all hazardous wastes are properly managed and are not improperly disposed.

Specific questions regarding hazardous waste and your responsibilities can be answered by the Hazardous Waste Specialist that inspects your business. To reach your specialist, call us at (714) 667-3600. We’re here to help!



# Chapter 1

## Hazardous Waste

### Introduction

Hazardous waste can be generated in many ways. Hazardous waste includes: used oil, spent solvents, cleaning compounds, discarded paints, by-products of chemical processes and discarded chemical formulations. If your business generates a waste, it is your responsibility to determine if the waste is hazardous (22 CCR §66260.200).

### Hazardous Waste

### What is a Hazardous Waste?

(22 CCR §66261.3)

A **Hazardous Waste** exhibits one or more of the following properties: it can ignite, be corrosive, explode, or prove toxic to living organisms. Many wastes are listed by name in Federal law or State regulation and some must be tested to determine if the waste is hazardous.

### What is a Listed Waste?

(22 CCR §66261.30, 66261.100, 66261.101, 66261.126)

A **Listed Waste** is specified in State or Federal laws or regulations. Listed wastes fall into two categories:

1. **Federally listed wastes** are those listed in Federal law (Resource Control and Recovery Act [RCRA]) or Federal regulations (Code of Federal Regulations [40 CFR Ch.1, Subpart D]). They are also referred to as **RCRA wastes**. These wastes are considered hazardous throughout the United States.
2. **California listed wastes** are those listed in California Law (H&SC, Chapter 6.5) or California Code of Regulations (22 CCR). They are also referred to as **non-RCRA wastes** and are considered hazardous in California.

### What is a Hazardous Waste Mixture?

What if I have a waste mixture that contains a listed hazardous waste?

(22 CCR §§66261.3, 66261.30, 66261.100, 66261.101)

A **waste mixture** is a combination of two or more wastes, any of which is a listed hazardous waste or exhibits characteristics of a hazardous waste. The mixture itself isn't necessarily a hazardous waste. Here's the bottom line:

- If the waste mixture contains a RCRA listed waste, it is always a hazardous waste.
- If the mixture contains only a non-RCRA listed waste, it is assumed to be hazardous waste unless laboratory analysis proves it to be nonhazardous. Such a waste must be analyzed by a ***State Certified Laboratory*** to determine whether it contained a listed waste, and to identify its applicable hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity.

## Am I a Hazardous Waste Generator?

To find out if you are a ***hazardous waste generator***, you must know your business' processes and the wastes you generate. A quick reference guide for many common wastes generated in selected industries is provided in Table 1. The information in Table 1, however, is not all-inclusive. To determine if you are a hazardous waste generator, you would:

1. Examine your business' processes, and waste streams to determine if you generate anything that might be considered hazardous waste. Study Table 1 to learn whether you generate wastes which are typically hazardous. The Hazardous Waste Specialist that inspects your business can help make initial determinations. A laboratory analysis of your wastes may be required.
2. If your waste cannot be excluded as a recyclable material, check to see if it is a listed waste. Listed wastes are considered hazardous wastes.
3. Even if it appears that you generate hazardous wastes, you may be exempt from classification as a hazardous waste generator if you can manage those wastes as ***excluded recyclable materials*** (see H&SC §25143.2). Some examples of recyclable materials are: a waste that can be reused onsite as a material, a waste that is sent to another facility or to the original manufacturer to be reused as an ingredient in an industrial process. Interpretation of the laws and regulations regarding excluded recyclable materials (22 CCR §66261.4 and H&SC §25143.2) is difficult; you may wish to contact your specialist for assistance.
4. If the waste is neither an excluded recyclable material nor a listed waste, determine if it exhibits any hazardous waste characteristics (Ignitability, Corrosivity, Reactivity, or Toxicity – see page 4 for more information). The waste must generally be analyzed by a State Certified Laboratory. If the laboratory results indicate the waste exhibits hazardous characteristics, the waste is hazardous and you are a hazardous waste generator.

### Is it possible to avoid the cost of a laboratory analysis?

Yes! By applying knowledge of the hazardous characteristics and composition of your processes and wastes, you might be able to determine if a waste is nonhazardous and avoid laboratory analysis. Examples of wastes for which you can employ a self determination are catalyzed fiberglass resins and reacted urethane compounds (22 CCR §66262.11).

## Excluded Recyclable Materials

# Table 1

## Typical Waste Streams Produced By Hazardous Waste Generators

<b>Vehicle Maintenance</b>	<b>Chemical Manufacturers</b>
Solvents	Waste Chemicals
Waste Oils	Cyanide Wastes
Used Oil Filters	Solvents
Waste Ethylene Glycol	
<b>Printing and Allied Industries</b>	<b>Laundries and Dry Cleaners</b>
Ink Sludges	Perchloroethylene Waste
Solvents	Waste Filters/Media
Silver Fix	Stoddard Solvent
<b>Pesticide Application Services</b>	<b>Schools</b>
Waste Containers	Vehicle Maintenance Wastes
Excess Pesticide(s)	Lab Wastes
Solvents	Silver Fix
Oils	
Pesticides (outdated)	<b>Laboratories</b>
	Acids/Bases
<b>Machine Shop</b>	Solvents
Sludges With Heavy Metals &/or	Waste Lab Samples that Tested
Oils	Hazardous
Solvents	
Water Soluble Coolant	<b>Automotive Paint Shop</b>
Waste Oil	Waste Thinner
	Waste Paint Sludge
<b>Retail Markets</b>	Used Paint Filters
Silver Fix	
Pesticides	<b>Building Cleaning and</b>
Waste Paint	<b>Maintenance</b>
	Waste Cleaners
<b>Metal Anodizing and Printed</b>	Solvents
<b>Circuit Boards</b>	
Waste Containers	
Cyanide Wastes	
Heavy Metal Wastes	
Spent Plating Wastes	
Silver Fix	
<b>Furniture/Wood Manufacturing</b>	
<b>and Refinishing</b>	
Solvents	
Paint Wastes	
Used Paint Filters	
Wood Preserving Agents	

# The Four Hazardous Characteristics

## Ignitability, Corrosivity, Reactivity and Toxicity

(22 CCR Chapter 11, Article 3)

Four characteristics are used to determine whether a waste is hazardous: **ignitability**, **corrosivity**, **reactivity** and **toxicity**. Each characteristic requires the use of different criteria for analysis.

### 1. Ignitability

(22 CCR §66261.21)

Wastes which will easily catch fire exhibit the hazardous waste characteristic of ignitability. A waste which...

- Has a flash point less than 140½ F,
- Is readily ignitable, or
- Is an oxidizer (as defined in 49 CFR)

is a hazardous waste.

Examples of wastes that might be ignitable are: solvent wastes, metal or mineral dusts (*e.g.*: aluminum, magnesium, or phosphorus).

*Note: Flash point is determined by the Pensky-Martens Closed Cup Tester or by the Setaflash Closed Cup Tester.*

### 2. Corrosivity

(22 CCR §66261.22)

Liquid wastes or solid wastes when mixed with water, which have a pH less than or equal to 2, or greater than or equal to 12.5 ( $\text{pH} \leq 2$  or  $\text{pH} \geq 12.5$ ) exhibit the hazardous waste characteristic of corrosivity. Corrosives are acids (low pH) or bases (high pH). If a liquid waste corrodes steel at a rate greater than 0.25 inches per year, the waste is corrosive and is thus hazardous.

Examples of corrosive wastes are: caustic hot tank liquid wastes and metal finishing process tank wastes.

### 3. Reactivity

(22 CCR §66261.23)

A waste which is unstable and/or produces toxic gases when mixed with water exhibits the hazardous characteristic of reactivity. These are wastes which exhibit the following properties:

- Are normally unstable and readily undergoes violent change without detonating,
- React violently with water,
- Generate toxic gases when mixed with water,
- Are cyanide or sulfur bearing wastes which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases,
- Are capable of detonation or explosion if heated or placed under confinement,

- Are readily capable of detonation, explosive decomposition, or reaction at standard temperature and pressure,
- Are forbidden explosives (49 CFR §173.51), Class A explosives (49 CFR §173.51), or Class B explosives (49 CFR §173.88).

Examples of reactive wastes are: picric acid, sodium metal, and cyanide.

## 4. Toxicity

A waste which exhibits the characteristic of toxicity has a potential, when eaten, inhaled, or touched, to harm humans or the environment. As you will see, toxicity testing can be quite complicated. Will discuss this procedure in detail because it is so often used (and so often confused!)

Basically, toxicity tests look for one or all of the following:

- Whether the waste can build up in an organism's body until it reaches a concentration that causes a disease or a disorder (Bioaccumulation Testing).
- Whether the waste can drain through a landfill and potentially contaminate groundwater (Landfill Testing).
- Whether a concentration of the waste will kill one-half of the laboratory animals exposed to it (Exposure Testing). Laboratory animals are used in lieu of testing the substance directly on humans. These results are then extrapolated to human exposures.

### a. Bioaccumulation Testing

(22 CCR §66261.24)

Wastes that contain toxic substances in excess of specified concentrations which accumulate in the body or the environment are considered hazardous wastes. Many of these substances are heavy metals such as arsenic, chromium, lead, mercury, and nickel. Wastes that often contain heavy metals are paint booth filters, metal grinding dust, and spent photographic fixer.

Two different concentrations, as determined by toxicologists, are used: the **Total Threshold Limit Concentration (TTLC)** and the **Soluble Threshold Limit Concentration (STLC)**.

- The TTLC is the maximum concentration allowed for a waste in **solid or powdered form** to be considered possibly non-hazardous. If the concentration of a waste is greater than the allowed TTLC value for that waste, the waste is toxic (and is thus hazardous waste). TTLC values are often much higher than STLC values.
- The STLC is the maximum concentration allowed for a waste in **liquid form** to be considered possibly non-hazardous. If the concentration of a waste is greater than the allowed STLC value for that waste, the waste is toxic (and is thus hazardous waste). STLC values are often much lower than TTLC values.
- When a waste is analyzed and the concentration of a substance is

California Toxicity  
Analysis:

TTLC & STLC

A more complete example is provided in Appendix C.

## Step 2 Summary:

- If  $\geq$  TTLC, then it's hazardous.
- If  $<$  TTLC, but  $>$  STLC, then proceed to step 3.
- If  $<$  TTLC and STLC, then it's nonhazardous.

## WET

found to lie between the accepted TTLC and STLC values for that substance, further analysis may be required.

Here are the steps involved:

1. Perform a test to determine the TTLC value of the waste. The test is sometimes called the "**TTLC**", "**Total Metals**" or "**Nitric Acid Test**". Note that for grinding wastes from metal solids, a **Sieve test** may be required first. (The Sieve Test determines the particle size of uncontaminated metal powders and dusts.)
2. If the tested concentration is equal to or greater than ( $\geq$ ) the accepted TTLC value for that substance, the waste is considered hazardous waste. If the tested concentration is less than ( $<$ ) the TTLC value, but is greater than ( $>$ ) the STLC value, then proceed to Step 3. If the tested concentration is less than both the TTLC and the STLC values, the waste is considered nonhazardous and no further analysis is necessary.
3. Multiply the accepted STLC value by a factor of 10. If the tested concentration (from the TTLC test) is less than 10 times the STLC, the waste is assumed to be nonhazardous.
4. If the tested concentration is more than 10 times the STLC, the waste is likely to be hazardous. At this point, you can agree to handle the waste as hazardous or you can subject the waste to further testing.
5. If you opt for more testing, the test to perform is the **Waste Extraction Test (WET)**. The test is sometimes also called the "**STLC**", "**Soluble Metals**" or "**Citric Acid Test**".
6. If the tested concentration for the WET test is equal to or greater than the accepted STLC value for that substance, it is considered hazardous waste. If the observed value is less than the accepted STLC value, it is considered nonhazardous.

Toxicologists have analyzed these contaminants to determine their potential to produce adverse health effects in humans and the environment. Acceptable levels of these contaminants, expressed in terms of their TTLC and STLC concentrations, are listed in Appendix C along with examples of their use.

## b. Landfill Testing

### Toxicity Characteristic Leaching Procedure

(22 CCR §66261.24)

## TCLP

The **Toxicity Characteristic Leaching Procedure (TCLP)** is a Federal procedure performed on wastes intended for landfill disposal. The TCLP determines if certain metals and organics are present in the waste. This is somewhat similar to the test performed to determine TTLC and STLC values. In California, the TCLP procedure is not as commonly used as the WET test and is usually performed after the WET test. Examples of wastes that would require the TCLP procedure are sludges which contain organics or solvents and sludges from vapor degreasers.



## c. Exposure Testing

### Acute LD-50 and Acute LC-50 Characteristics

(22 CCR §66261.24)

The terms **Lethal Dose (LD)** and **Lethal Concentration (LC)** refer to the concentrations of a substance that kills a proportion of a group of laboratory animals. Toxicologists generally refer to the concentrations that kill one-half (50%) of the test subjects; these concentrations are called **Acute Lethal Dose 50** (stated as **LD-50**) and **Lethal Concentration 50** (**LC-50**). A low LD-50 or LC-50 value means that less of the substance is needed to kill test subjects, and thus the more toxic it is. A higher LD-50 or LC-50 means that more of a substance is needed to kill test subjects, and thus the less toxic it is. So a substance with an LD-50 of 8 mg/kg would be more toxic than a substance with an LD-50 of 22 mg/kg.

The four types of LD-50 and LC-50 are oral, dermal, inhalation, and aquatic bioassay. Toxicity data are found in several reference books (e.g.: *The Merck Index* and the *NIOSH Registry of Toxic Effects of Chemical Substances and Hazardous Chemical Data Book*). Wastes with very low LD-50's fall into a special class of hazardous wastes called **Extremely Hazardous Wastes**. Arsenic, cyanide, and beryllium are all examples of extremely hazardous wastes.

LD-50

LC-50

Extremely Hazardous  
Wastes

## Incognito Wastes

Some common industrial wastes are often mishandled. These wastes have special regulations or State interpretations that require them to be stored and disposed differently than other hazardous and nonhazardous wastes.

We refer to them as incognito because most people do not immediately recognize them as potentially hazardous. Examples are spent aerosol containers, empty containers, used filters (oil, solvent and fuel), lead acid auto batteries, used shop rags, fluorescent light tubes, and old light ballasts.

### 1. Aerosol Containers

(22 CCR §66261.7)

Empty aerosol containers are not regulated as hazardous wastes unless they contained a material that is a listed RCRA hazardous waste (e.g: pesticides) or as an extremely hazardous waste. Aerosol containers that are empty may be discarded as municipal trash. The term "empty" means the propellant has been discharged to the maximum extent feasible under normal use. Partially full aerosol containers that contained a hazardous material must be disposed as hazardous waste.

## 2. Empty Containers

(22 CCR §66261.7)

A container is “empty” only if the contents are no longer pourable or if the contents have been scraped out as much as reasonably possible. If a container that contained a hazardous substance is not empty, the container must be disposed as a hazardous waste. If the container is empty, the handling varies with the volume of the container.

- **Five Gallons or less:**

Empty containers, or inner liners removed from containers, of five gallons or less that once contained a hazardous substance, are not regulated if all the contents have been poured out, or scraped out. Empty containers of five gallons or less may be discarded to the municipal trash.

- **Greater Than Five Gallons:**

Empty containers, or inner liners removed from containers, of greater than five gallons in size that once contained a hazardous substance, must be sent out on a bill of lading to a drum recycler or reconditioner for scrap value or sent back to the manufacturer for refilling within one year of being emptied. Containers greater than 5 gallons in size cannot be put into the municipal trash or municipal landfill.

## 3. Used Oil Filters

(22 CCR §66266.130)

Used motor oil filters are considered hazardous waste. Provisions have been made in the regulations to handle these filters as nonhazardous, as long as the filters are drained of any used oil and sent out for scrap metal recovery. Refer to “Drained Oil Filters in Chapter 2” for further information.

## 4. Other Filters

Used filters, such as solvent bath filters, auto fuel filters, radiator coolant recycler filters, and plating bath filters, are considered hazardous waste, unless laboratory testing proves them to be non-hazardous. The filters cannot be commingled, stored, or disposed with used oil filters.

## 5. Lead Acid Batteries (Auto Batteries)

(22 CCR §§66266.80 & 66266.81)

Auto batteries contain acid, lead, and other heavy metals. Used auto batteries do not have to be handled as hazardous waste if the following conditions are met:

- The batteries are intact (no cracked batteries or missing caps).

- The batteries are recycled.
- No electrolytes or acids are removed from the batteries.
- Batteries are stored to prevent the release of acid or lead to the environment.
- One ton or more cannot be stored more than 180 days.
- Less than one ton cannot be stored any longer than one year.
- Receipts (manifests or bills of lading) must be kept for three years.

## 6. Used Shop Rags

Rags and towels can be used to clean up small spills, but do not use them as your routine method for hazardous waste disposal. Rags and towels that are laundered for reuse are not regulated unless they are intentionally used as “the” method of hazardous waste disposal.

## 7. Fluorescent Light Tubes

Fluorescent light tubes, High Intensity Discharge (HID), and mercury vapor lamps contain elemental mercury metal and mercury compounds. Mercury is regulated by the U.S. Environmental Protection Agency (U.S. EPA) and the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) as a toxic and bioaccumulative substance. Studies have determined that a single 4 foot fluorescent light tube contains mercury metal in excess of the regulatory concentrations established for toxicity (TCLP, TTLC & STLC). Currently, there are no specific regulations addressing light tubes. However, the DTSC has adopted an interim policy that allows small businesses to dispose up to 25 fluorescent light tubes daily as non-hazardous waste. Fluorescent tubes in quantities greater than 25 daily, plus all HID, and all mercury vapor lamps, may be hauled on a bill of lading and sent directly to a DTSC-approved lamp recycler or the lamps must be handled as hazardous waste. Recycled tubes and lamps are exempt from the manifesting and transportation requirements for hazardous waste.

### a. Fluorescent Light Ballasts Manufactured Prior to 1979:

(22 CCR, §§67426.1 through 67429.1)

Waste fluorescent light ballasts may contain PCBs (Polychlorinated biphenyls). PCBs are regulated as a hazardous waste. The majority of all light ballasts manufactured before 1979 contain PCBs. After January 1, 1979, ballasts could not be manufactured with PCBs, and must be labeled, “No PCBs”. A “No PCBs” ballast can be identified by one or more of the following methods:

- “No PCBs” printed on a label,
- Date code stamp indicating manufacture after 1979 appears on the ballast, or

- The ballast manufacturer identifies the ballast by model number. All ballasts which cannot be readily identified as not containing PCBs must be managed as if the ballast contained PCBs. Disposal of PCBs must be in accordance with Hazardous Waste Regulations.

## Waste Determinations

Waste determinations can often be challenging and sometimes time consuming. Ways to reduce the time spent on waste determinations are:

1. Contact your Specialist, who is a valuable resource in waste determinations, at (714) 667-3600.
2. Write for a useful reference booklet entitled ***Handbook for the Analysis and Classification of Wastes***. The address is: California Environmental Protection Agency, Department of Toxic Substances Control, Waste Evaluation Unit, P.O. Box 806, Sacramento, CA 95812-0806.

# Chapter 2

## Onsite Storage and Handling of Hazardous Waste

### Introduction

After a waste is identified as hazardous, it must be stored, labeled and disposed according to provisions of the California Code of Regulations (CCR), Title 22.

### Storage Containers & Tanks

Hazardous waste must be stored in non-leaking containers made of materials compatible with the waste. Types of storage containers include:

#### 1. Containers/Drums

(CCR, §66265.170 et. al.)

- Maintained in good condition with tight fitting lids
- Made or lined with materials which are compatible with the hazardous waste stored inside (e.g., acids and caustics stored in plastic drums; oils, flammables or combustibles stored in steel drums)
- Kept closed when not in use
- Properly labeled
- Handled or stored in a manner to prevent rupture or leakage
- Inspected at least weekly

#### 2. Underground Storage Tanks (USTs)

(H&SC §25280 through 25299.7, and CCR, Title 23, Division 3, Chapter 16)

- Maintained according to State laws and regulations and enforced by the Orange County Health Care Agency and local fire departments. *The cities of Anaheim, Fullerton, Orange and Santa Ana regulate underground storage tanks within their jurisdictions.* The Orange County Health Care Agency, Environmental Health Division regulates USTs in all other regions of the County.

#### 3. Aboveground Storage Tanks

- Maintained in accordance with State laws and regulations enforced by local fire jurisdictions, and in compliance with the above referenced container/drum requirements.

## Storage Areas

1. Hazardous waste must be stored in a secured location to prevent unauthorized access, preferably under a roofed area with an impermeable floor.
2. Good housekeeping is an essential practice for the proper storage of hazardous waste.
3. Adequate aisle space must be maintained to allow for emergency equipment.
4. Containers of incompatible waste must be separated by means of a dike, berm, wall, or similar device.
5. Storage of ignitable or reactive wastes must be at least 50 feet from the property line.
6. Storage must comply with all applicable fire codes and storm water requirements.

## Labeling

Hazardous waste must be properly labeled. The type of label is dependent upon the container size and/or the contents of the container.

### 1. Hazardous Waste

(22 CCR, §66262.34)

- a. Each hazardous waste container that is ***portable or less than 110 gallons*** and used for storage *on the premises* (not for transportation) must be properly labeled with:
  - The words “Hazardous Waste”
  - Contents of the container (e.g., waste oil, perchloroethylene, radiator coolant)
  - Name and address of the generator
  - Hazardous properties of the waste (e.g., flammable, toxic, reactive, corrosive)
  - Physical state (e.g., liquid, solid, gas)
  - Initial starting date for waste accumulation
- b. For hazardous waste stored in ***stationary containers greater than 110 gallons***, the words “Hazardous Waste” and the accumulation date are to be clearly marked on the container.
- c. Containers ***used to transport hazardous waste*** must include labels with the words “Hazardous Waste”, plus the following statement and additional information below.
  - “State and Federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, the U.S. Environmental Protection Agency, or the California Department of Toxic Substances Control.”
  - Name and address of the generator

- Manifest document number

Requirements for labeling *on-premises* may be met by permanently affixing the information onto the container by stenciling, painting, or by using an adhesive label. Stenciling or painting is preferred for reusable containers, while adhesive labels (self-made or obtained from commercial vendors) are preferred for containers that will be transported off-site.

## 2. Recyclable Material

(H&SC §25143.9)

***Excluded recyclable material*** (as defined by the Health and Safety Code, §25143.2) must be handled, stored and labeled on the premises in the same manner as hazardous waste with the exception that the words “Hazardous Waste” on the label is replaced with the words ***“Excluded Recyclable Material”***. This material is subject to the ninety (90) day storage requirements.

## 3. Drained Used Oil Filters

(22 CCR, §66266.130)

Containers of drained used oil filters which are *recycled offsite* at a scrap metal recycler must be labeled only with the words ***“Drained Used Oil Filters”*** and the *initial date of accumulation*.

- Storage of less than one ton of used oil filters is limited to one year.
- Storage of one ton or more of used oil filters is limited to 180 days.
- Storage beyond these limits requires a hazardous waste facility permit issued by the California Environmental Protection Agency, Department of Toxic Substances Control.

When drained oil filters are *not recycled offsite*, they must be stored and disposed as hazardous waste, or if a waste determination (see Chapter 1) finds the filters to be non-hazardous, the storage and disposal requirements for hazardous waste do not apply.

# How Long May I Store Hazardous Waste?

## Storage Times

(22 CCR §66262.34)

The storage time length is based upon the quantity of hazardous waste stored and the rate that the waste is generated. Satellite storage accumulation (see below) may also be used in conjunction with the other options.

### 1. Conditionally Exempt Small Quantity Generators (CESQG):

A business generates *less than or equal to 100 kg* (220 pounds or approximately 27 gallons) of hazardous waste per month.

*The hazardous waste must be transported offsite within ninety (90) calendar days **once** 100 kg of hazardous waste have accumulated.*

*If you generate 100 kg per month or less (220 lbs or less, 27 gals. or less), then dispose all hazardous waste within 90 days after you reach that amount.*

If you generate more than 100 kg (more than 220 lbs, more than 27 gals.), but less than 1,000 kg, (less than 2,200 lbs, less than 275 gals.), then dispose within 180 days after you reach that amount.

If you generate more than 1,000 kg, (more than 2,200 lbs, more than 275 gals.) per month, all hazardous waste must be disposed within 90 days.

Satellite accumulation allows hazardous waste to be stored near the process that generated it.

Satellite waste accumulation may not exceed one year from the initial date of accumulation.

## Extremely Hazardous Waste

### 2. Small Quantity Generators (SQG):

A business generates **more than 100 kg** but **less than 1,000 kg** (between 220 and 2,200 pounds, or 27 and 275 gallons) of hazardous wastes per month.

- Hazardous waste may be stored onsite for up to 180 days. or
- If the waste must be transported over a distance of 200 miles or more, the generator may store the waste for up to 270 days.

The preceding storage times apply only if the following conditions are met:

- The quantity of hazardous waste accumulated onsite never exceeds 6,000 kg,
- The generator has complied with all of the contingency plan requirements (refer to Chapter 5 of this guide),
- The generator does not store extremely hazardous or acutely hazardous waste in an amount greater than 1 kg (2.2 pounds) for more than 90 days.

### 3. Large Quantity Generators (LQG):

A business generates **more than 1,000 kg** (2,200 pounds or approximately 275 gallons) of hazardous wastes per month.

**Hazardous waste cannot be stored for more than ninety (90) days.**

### 4. **Satellite accumulation** allows storage of small amounts of hazardous waste for up to one year. More than one satellite accumulation site may be used and this rule applies to any business regardless of the quantity of waste generated on the premises as long as the following conditions are met:

- Waste is stored at the initial point of generation and under control of the operator of the process generating the waste.
- A maximum of 55 gallons of hazardous waste or one quart of extremely hazardous waste is accumulated at any one satellite location.
- Containers or drums are properly labeled.
- Within three (3) days after reaching the maximum storage quantity, a new accumulation date (date that limit was reached) must be marked on the container and the waste removed offsite within the specified time limit (SQG or LQG).

**Note:** If your business generates **extremely hazardous waste** as defined in CCR, Title 22, §66261.107, contact Environmental Health at (714) 667-3600 for specific information regarding its proper storage, handling and disposal.



# Chapter 3

## Hazardous Waste Transportation, Disposal, and Record Keeping

### Introduction

If your business generates hazardous waste, you must comply with certain transportation, disposal and, record-keeping requirements. Hazardous wastes may be transported offsite by one of these five methods: milk run, bill of lading, self hauling, consolidation, or full manifest. This chapter explains the different transportation methods and record-keeping requirements for businesses that generates hazardous waste.

### What is an EPA ID Number?

(22 CCR §66262.12)

Businesses that generate hazardous waste must obtain an EPA identification number in order to ship a hazardous waste offsite for treatment or disposal.

To obtain an EPA identification number, contact the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), at (800) 618-6942 or (916) 324-1781. EPA identification numbers are site and business specific. DTSC must be notified if a business generating hazardous waste moves or changes address. If your business generates only used oil or waste automotive parts cleaning solvents at a rate of 100 kilograms (220 pounds) or less a month (of total wastes), the business does not need an EPA identification number.

### Milk Run Waste Removal

(22 CCR §66263.42)

If your business generates hazardous waste that qualifies as a “milk run” waste, you are not required to use a full hazardous waste manifest. For “milk run” wastes only, the transporter provides you with a receipt or shipping paper as documentation for waste disposal. The transporter will, at the end of the day, or when the truck becomes full, attach all the shipping papers to the main manifest that will be sent to the proper destinations. Listed below are wastes that can be hauled using the milk run procedure:

- Automotive parts cleaning solvents
- Spent photographic solutions
- Waste automotive antifreeze
- Sludge containing sodium hydroxide and heavy metals (hot tank sludge)
- Dry cleaning solvent waste including perchloroethylene
- Asbestos
- Inks from the printing industry
- Chemicals and lab packs collected from school districts

The receipt or shipping paper must contain the following information:

- The generator's name, address and EPA identification number
- The name, signature and telephone number of the generator's contact person
- The transporter's name, address and EPA identification number
- The proper shipping name of the waste
- The quantity of waste taken
- The date the waste was taken by the transporter
- The name, address and EPA identification number of the receiving facility
- The transporter's manifest document number
- In the case of school chemical collections, the drum number and contents

## Used Oil

(H&SC §25250.8)

Used oil may also be transported using a similar receipt as required for "milk run" wastes. The receipt must contain the following information:

- The generators name and address.
- The signature and telephone number of the generator's contact person.
- The transporter's name, address and EPA identification number.
- The driver's signature.
- The proper shipping name of the waste.
- The quantity of waste taken.
- The date the waste was taken by the transporter.
- The name and address of the receiving facility.
- The transporter's manifest document number.

## Bill of Lading

A bill of lading is a standard shipping paper used to transport recyclable materials. A bill of lading includes such information as the date, name of the transporter, name and quantity of material shipped, and the destination of the material. Recyclable materials may be shipped using a bill of lading instead

of a uniform hazardous waste manifest (see below). Common items shipped on a bill of lading are: used oil filters, batteries, foundry sands, and off specification urethane components.

## Self-Hauling

(H&SC §25163[c])

Businesses may transport up to five (5) gallons or fifty (50) pounds of a hazardous waste directly to a Treatment, Storage or Disposal Facility (TSDF) if the container is properly sealed, labeled and taken directly to a TSDF for disposal. Approval from the TSDF is recommended prior to hauling the waste.

If your business generates small amounts of **waste oil** you may transport used oil yourself without a manifest if:

- Each container's contents do not exceed 5 gallons.
- The total load does not exceed 20 gallons.
- The person who transports the used oil generated the used oil.
- The used oil is taken to a facility which agrees to and can accept used oil.

## Consolidation

If you own one or more remote locations, you may consolidate waste at a central site. The waste is deemed to have been generated at the consolidation site. RCRA and non-RCRA, waste may be consolidated. See Appendix D for specific requirements.

## California Uniform Hazardous Waste Manifest

(22 CCR §§66262.20 & 66262.23)

Businesses that generate a hazardous waste that do not qualify for any of the previous transportation and or disposal methods must use the full hazardous waste manifesting procedure. If the waste is to be sent to a TSDF within California, then the California uniform hazardous waste manifest, issued by DTSC, must be used. The uniform manifest contains the following information:

- The nature and quantity of waste transported offsite
- The name of the generator
- The contact in case of emergency
- The name of the transporter(s)
- The date the waste was taken
- The facility where the waste is being recycled, treated or disposed

## Where Can I Get Manifests?

Hazardous waste transporters usually provide manifests, however, should you decide to order California hazardous waste manifests, contact:

**Department of General Services  
Documents & Publications  
P.O. Box 1015  
North Highlands, CA 95660  
(916) 574-2200**

The California hazardous waste manifest consists of six copies. After the manifest is completed, *you keep a yellow copy* and then *mail the blue copy to DTSC* within 30 days. The transporter takes the remaining copies to the Treatment, Storage or Disposal Facility (TSDF). After the load is accepted, the TSDF representative signs the remaining four copies, keeps their copy, gives the transporter a copy, sends the generator a completed manifest (yellow TSDF copy) within 30 days, and mails the completed original manifest to DTSC within 30 days.

## Exception Reporting

(22 CCR §66262.42)

If the TSDF signed copy is not received within 35 days of shipping the waste, you should contact the transporter or the TSDF to inquire about the shipment. If after 60 days, the TSDF signed copy is still not received, you must notify DTSC with an Exception Report. The Exception Report must contain the following information:

- A legible copy of the manifest used (photocopy of the generator's initial yellow copy).
- A cover letter signed by the generator, or authorized representative explaining the efforts taken to locate the hazardous waste, and the outcome of those efforts.

Exception reports must be sent to:

**California Environmental Protection Agency  
Department of Toxic Substances Control  
Manifest Exception Report  
P.O. Box 3000  
Sacramento, CA 95812**

## What About Out-of-State Shipments?

- Shipping RCRA waste out-of-state requires the generator to use the receiving state's hazardous waste manifest. If the receiving state does not have a state hazardous waste manifest, the California hazardous waste manifest must be used. When the generator receives the out-of-state completed manifest (TSDF copy), a copy must be sent to DTSC within 30 days.
- Non-RCRA wastes that are transported out-of-state for disposal must be shipped using a California hazardous waste manifest even if the receiving facility is not a TSDF. The business shipping the waste must obtain a signed copy from the destination facility. The receiving facility must be in compliance with H&SC Section 25160(b)(3), and 22 CCR Section 66262.23(e).
- Land disposal restrictions (LDRs) are Federal and State regulations that have established treatment standards for hazardous waste before the waste is disposed at a qualified landfill facility. If the hazardous waste does not meet applicable treatment standards, it is the responsibility of the generator to notify the TSDF of the appropriate treatment. The LDR notification (22 CCR §66268.1) is fastened to and must be kept with the manifest.

## Registered Hazardous Waste Transporter

It is the responsibility of the generator to ensure that the hazardous waste is hauled by a state registered transporter. Transporter verification questions may be answered by DTSC Transportation Unit at (916) 323-3219. A good source for locating transporters is the *Business to Business* telephone directory.

## Record-Keeping Requirements

(22 CCR §66262.40[b])

All manifests, shipping papers and or receipts, analyses and determinations must be available for review onsite for a minimum of three years. Businesses that generate and ship hazardous waste off site to a TSDF within the United States are required to summarize all manifesting activity. The summary is referred to as the biennial report, EPA Form 8700-13A/B 5-80. Businesses that generate RCRA hazardous waste are required to submit the biennial report by March 1 of every even-numbered year.



# Chapter 4

## Source Reduction

### Introduction

The State of California considers source reduction of wastes as the preferred method of managing hazardous wastes. In order to reduce wastes at the source, a business must look at the processes that create the wastes and implement actions that will either cause a net reduction in the amount of hazardous waste generated or result in the generation of a waste that is less hazardous. The term hazardous waste minimization includes source reduction and recycling.

### What is Waste Minimization?

The reduction of hazardous waste that is generated before treatment, storage, or disposal of the waste. This includes both source reduction and recycling actions. Recycling can be either the use, reuse or reclamation of a hazardous waste. Reclamation of a waste can be done onsite or offsite. If a waste is reclaimed onsite by some form of treatment process and then reused onsite, no treatment permit is required.

### Waste minimization does not include:

- Concentrating or evaporating the waste to reduce its volume,
- Diluting the waste to reduce its hazardous properties,
- Shifting hazardous wastes from one environmental medium to another,
- Treatment.

### What are the incentives for businesses to reduce their wastes?

1. Reduction in the liability associated with the handling, storage, and disposal of hazardous wastes (cradle to grave liability).
2. Reduction in hazardous waste disposal costs and hazardous material costs.
3. Reduction in employee exposures to hazardous materials and wastes.
4. Reduction in regulatory requirements.

## Are there any regulatory requirements for reducing wastes?

Yes!

The State of California passed the Hazardous Waste Source Reduction and Management Act in 1989 (SB-14). This Act requires businesses who routinely generate 12,000 kilograms of hazardous waste or more than 12 kilograms of extremely hazardous waste in a year to prepare the following two documents:

1. Source reduction review and plan.
2. Hazardous waste management performance report.

These documents were initially due on September 1, 1991, and will be required every 4 years thereafter. Automotive fluids, PCBs and lead acid batteries are some of the types of wastes that are exempt from the determination of a business's quantity of routinely generated wastes. A full list of exempt wastes may be found in 22 CCR, §67100.2(c).

This program is administered by Cal-EPA, Department of Toxic Substances Control. For more information on source reduction plan requirements call the Source Reduction Unit at (916) 322-3670.

Other regulations also may require waste minimization programs. These regulations include Tiered Permitting, manifests, U.S. EPA Biennial Reports and Toxic Release Inventory (TRI) reporting.

## How do I get started?

If a business is required to submit a source reduction plan, there are documents and fact sheets available to help businesses in reviewing the waste generating processes and preparing the necessary plans. For technical assistance, call us at (714) 667-3600 and ask to speak with our Pollution Prevention Specialist.

## Industry-specific Waste Minimization Opportunities

### Automotive Repair Industry

- Avoid spills, use funnels when pouring waste in storage containers
- Use drip trays when working on vehicles
- Substitute hazardous materials with less hazardous materials or non hazardous materials where possible
- Practice inventory control of materials
- Use mechanical brushes instead of rags when using solvent to clean parts
- Close solvent tanks when not in use



## Dry Cleaning Industry

- Inspect equipment for leaks
- Improve operating practices to reduce solvent loss
- Launder textiles that do not require dry cleaning
- Substitute presently used solvents with less hazardous or non-hazardous solvents
- Recover and recycle waste solvent
- Replace transfer machines with dry-to-dry machines

## Photo Processing Industry

- Counter-current rinsing to reduce water consumption
- Use iron-complexed bleaches to replace ferricyanide bleaches
- Recover silver from exhausted fixes
- Recover and reuse various chemical processes

## Paint Formulation Industry

- Practice good housekeeping to avoid generating unnecessary wastes
- Substitute water-based for solvent-based formulations whenever possible
- Substitute non-hazardous pigments to eliminate lead and chromium
- Use non-mercury bactericides
- Use stainless steel screens for filtering
- Use pigments in slurry form (reduces waste bags and packages)
- Reuse cleanup solvent

## Printing Industry

- Switch from chemical processing to water processing of lithographic plates
- Recycle waste inks and cleanup solutions
- Install automatic ink-levelers to maintain optimum inking conditions
- Use alternative cleaning solvents
- Use less hazardous inks, such as soy-based
- Use alternative fountain solutions

## Metal Finishing Industry

- Segregate waste streams to avoid contaminating non-hazardous material
- Replace cyanide baths with non-cyanide process baths
- Use water-based cleaners instead of solvents for cleaning operations
- Use air knives or spray rinses above process tanks to rinse excess solutions off of work pieces into the process tank
- Use dedicated drag-out tanks after process baths to capture drag-out

- Install rails above process tanks to hang workpiece racks for drainage prior to rinsing
- Install multiple rinse tanks including counterflow rinse tanks

***Refer to Appendix G for a list of Waste Minimization publications.***

# Chapter 5

## Emergency Procedures

### Introduction

Planning and preparing for different types of emergencies that can occur at a business site, such as a fire, an earthquake or a hazardous waste incident, is mandated by law. According to State hazardous waste laws and regulations, businesses must be maintained and operated to minimize the possibility of a release of hazardous waste to the air, soil, or surface water to prevent a threat to human health or the environment.

### Are there requirements for emergency planning?

Yes, all hazardous waste generators are required to prepare a contingency plan. There are two levels of reporting which are dependent on the total amount of hazardous waste generated. Businesses generating 1,000 kg (2,200 pounds or 2,700 gallons) or more hazardous waste per month must complete a full contingency plan. Businesses generating less than 1,000 kg per month may opt to follow the RCRA oriented contingency plan requirements for Small Quantity Generators.

### Contingency Plan

(22 CCR §§66265.50-66265.56)

A contingency plan is a written plan that has emergency procedures designed to minimize hazards to human health or the environment. The contingency plan will help all emergency responder teams handle any emergency involving stored hazardous waste.

All hazardous waste generators are responsible to plan for emergencies at their business and are required to have a contingency plan.

The contingency plan should be written in layman's terms and must include the following:

1. Business name, address, telephone and fax (if available).
2. A description of actions, which may include procedures such as berming, absorbing, etc., that the employees must take to minimize hazards in response to emergencies, such as fire, explosion, or any release of hazardous waste.

### Contingency Plan Requirements for LQG and Extremely Hazardous Waste

See Appendix E for a copy of a Contingency Plan that you can use.

## Business Plan

3. List of communication equipment—employees handling hazardous waste must have access to either an alarm system, a communication system, or be in voice contact with another employee. Employees working alone must have access to a telephone or a two-way radio to call for assistance.
4. The name, address, and telephone numbers (work and home) of an employee qualified to act as an emergency coordinator.
5. The names, addresses, and telephone numbers (work and home) of alternate emergency coordinators.
6. A list of emergency equipment and where it is located (i.e., fire extinguisher, alarms, spill control equipment, etc.)
7. The current telephone number of the State Office of Emergency Services, (800) 852-7550 or (916) 427-4341.
8. The names, addresses, and phone numbers of the following should be included in the contingency plan:
  - Police Department
  - Fire Department
  - Local hospital
  - Contractors (consultants, haulers for hazardous waste removal/cleanup)
9. A detailed site plot plan
10. An evacuation plan
11. Records of employee training

## Where should I keep copies of the contingency plan?

Copies of the contingency plan and any changes made to the plan should be kept at the site.

A business emergency response plan, also called a **Business Plan**, may be required by local fire departments when a business exceeds certain quantities of stored hazardous materials. In place of a contingency plan, we will accept an approved business plan if it is amended with any information missing from the list above.

## Do I Need to Train my Employees?

(22 CCR §66265.16)

Employees involved in the management of a hazardous waste must complete a training program.

## What type of training do I need to provide?

There are two types of training:

- Job-site training (with hands-on involvement)
- Classroom instruction

The type, quality and quantity of training depends on the needs of each business.

The person conducting training may be a professional training coordinator or an experienced staff person trained in onsite hazardous waste management procedures.

A training program should have the following:

1. Training should teach employees how to do their duties in a way that complies with proper handling of hazardous waste.
2. The training program should make sure that employees are able to handle emergencies. The following topics must be included:
  - Communications or alarm systems
  - Response procedures to fires and explosions
  - Response to spills or leaks
  - Procedures for shutdown of operations (equipment, electric meter box, gas valves, etc.)
  - Procedures for using, inspecting, repairing and replacing emergency and monitoring equipment
  - Procedures for use of automatic waste feed cut-off systems
3. Training must be completed within six months of the date of employment. ***Untrained employees may not work unsupervised*** with hazardous wastes until training is complete. An annual refresher training is also required.

Employees should be informed of the hazardous properties of the materials and wastes to which they are exposed. One method of informing them includes reading and understanding the Material Safety Data Sheets (MSDS) for all hazardous materials used.

## What type of training records must I maintain?

Training records require a brief write-up of the following information:

1. The job title and a description for each position at the business related to handling hazardous waste, and the name of the employee filling the job
2. A description of the type and amount of training that will be given to each person
3. A record detailing who received the training and what training was received (written documentation of employee attendance is recommended)
4. Training records on current employees must be kept until closure of the business
5. Training records of former employees must be kept for at least three years from the date the employee last worked at the site.

## Contingency Plan Requirements for SQG

## Equipment Requirements

## Emergency Coordinator

# Contingency Plan Requirements for Small Quantity Generators

(40 CFR 262.34 (d)(e)(f), 22 CCR §§66262.34 (d)(2))

### What is in a Contingency Plan?

There are 4 basic components of the SQG contingency plan; communication and emergency response equipment (spill control etc.), notification of your local hospitals and emergency responders, employee training, and designating an emergency coordinator. Simply put, the written contingency plan must identify what types of emergency equipment is onsite, and describe the actions facility personnel take in response to fires, explosions, or spills. The amount of detail within your plan depends on the type of hazardous waste you generate, and any special requirements that would apply as a result. Although your business may be categorized as SQG, this contingency plan is applicable only if the following conditions are met:

- Hazardous waste storage never exceeds 6000 kg
- The drums and containers are properly managed, kept in good condition (no leaks), be compatible with the material stored within and must always be closed when in storage
- Storage areas are inspected at least weekly
- Incompatible wastes must be properly segregated
- Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or release of hazardous waste

### Communication and Spill Response

As required, the following equipment must be present:

- Internal communications or alarm equipment (telephone, voice)
- Telephone, two way radio
- Portable fire extinguishers, spill control equipment, and decontamination equipment
- Water in adequate volumes

Additionally:

- All equipment shall be maintained, and tested to ensure proper operation where hazardous waste is being poured, spread or mixed
- All personnel involved in the operation must have immediate access to an alarm or other emergency communication device
- Adequate aisle space shall be maintained for unobstructed movement of personnel, fire control equipment and spill control equipment

### The following information must be posted next to the telephone:

- Name and telephone number of the emergency coordinator
- Location of the fire extinguishers and spill control material, and fire alarms if present
- Telephone number of the fire department, unless there is a direct alarm

### Coordinating with Local Emergency Service Providers

As appropriate for the wastes handled at your facility, the following providers need to be provided a copy of your contingency plan:

- local fire departments
- local police departments
- state emergency response teams
- local hospitals

If your local authorities or emergency service providers decline to take a copy of your contingency plan, document the refusal in your operating plan.

### Emergency Coordinator

An emergency coordinator is an employee who is designated to respond in the event an emergency arises. If summoned, this employee must have the ability to assist in coordinating with the emergency responders (facility layout, knowledge of what types of chemicals and wastes are stored, and their location within the facility). The designated emergency coordinator(s) must be on call after hours.

### Reporting

In the event of a fire, explosion or release that could threaten human health outside the facility, or when the generator has knowledge that a spill has reached surface water, the generator must immediately notify the National Response Center (800) 424-8808. A report must include the following information:

- Name, address and EPA identification number of the generator
- Date, time and type of incident
- Quantity and type of hazardous waste involved
- Extent of injuries, if any
- Estimated quantity and disposition of recovered materials, if any

### Training

All employees shall be thoroughly familiar with the proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies.

Notification

Reporting

Training





# Chapter 6

## Tips for Staying in Compliance

### Introduction

Regulatory compliance is a major issue of concern today for most businesses involved with hazardous waste management. Several pointers are presented to keep businesses in compliance with hazardous waste laws. A list of the most common violations and answers to many commonly asked questions will also be addressed. Hopefully, these tips will make compliance easier.

### What to Expect During an Inspection

Orange County Health Care Agency inspectors conduct annual unannounced site inspections to observe daily hazardous waste operations. During the inspection, we conduct site tours similar to the self audit described in Chapter 7 of this manual. Hazardous waste records (i.e., manifests, receipts, contingency plan and training records) will be reviewed. Having all hazardous waste records organized and readily available will expedite the inspection process. A written report with any violations noted during the inspection will be reviewed with the onsite contact person and left onsite. Deadlines to correct any violations may be established and a reinspection to verify compliance may be conducted. We encourage you to ask questions. Asking questions helps clear up issues not thoroughly addressed during the inspection. We will try to answer all questions on issues related to the inspection.

### Common Hazardous Waste Violations

1. Each container/tank is not labeled with the required information.
2. Copies of manifests/receipts are not available for review.
3. Containers are not stored closed.
4. Hazardous waste determination has not been made for all wastes.
5. Hazardous waste was stored for more than 90 days.
6. Generator has no EPA Identification Number.
7. Manifests are not used for transporting hazardous waste.
8. Released waste is improperly disposed.
9. Contingency Plan is not available for review.
10. Training Records are not available for review.

## Frequently Asked Questions

1. Why do I receive a hazardous waste fee when I do not have any hazardous waste?

Businesses with only waste oil or parts washing solvent frequently ask this question. Waste oil and parts washing solvents are considered hazardous wastes in California. Confusion arises when the same service company delivers new solvent and hauls away waste solvent. So why is the parts washing solvent regulated? The new parts washing solvent, a hazardous material, gets dirty with use and eventually becomes unusable. The dirty solvent is now a waste, a hazardous waste, which you must have properly hauled and disposed.

2. Different agencies (i.e., Health Care Agency, Fire Department, Air Quality District, and Sanitation District) seem to duplicate each other's work. Couldn't one inspector represent all of the agencies and conduct one inspection?

Each agency is charged with the responsibility to enforce different laws, regulations, and local requirements. For example, the Health Care Agency enforces the California Health & Safety Code and the Fire Departments enforce the Uniform Fire Code. These statutes require different types of inspections. Sometimes, however, the *target* of the inspections overlap as when the Health Care Agency and the Fire Department both examine your hazardous waste. The Health Care Agency is looking for proper waste handling from a health risk perspective, while the Fire Department looks at hazardous waste from a fire hazard perspective.

The idea of coordinating these inspection programs is not new. In 1994, Governor Pete Wilson signed *Senate Bill 1082* into law which mandates a coordinated hazardous waste regulatory program. It created a *Unified Program* for the regulation of hazardous waste and materials, plus underground and aboveground storage tanks. The program will be administered by agencies certified by the State to serve as *Certified Unified Program Agencies* (CUPA) for particular jurisdictions. In Orange County, the Health Care Agency, Environmental Health Division, was designated the CUPA. Our office can provide more details upon request by calling (714) 667-3600.

3. Do I have to label each hazardous waste container with all that information?

Yes. Each portable container that is 110 gallons or less must be labeled with all the required information on the container as outlined in Chapter 2. The container must be labeled as soon as waste is put into the container—not right before the waste is hauled. Special adhesive labels are not necessary, just the information.

4. Labels don't stick to my oily drums, how can I label the container?

Adhesive labels stick best on clean containers. By avoiding spillage

and maintaining a clean container, you may find it easier to keep the container labeled. If the labels still do not stay on the container, try using a paint pen or stencil to write the information on the container.

5. Didn't you just conduct an inspection last month?

Orange County Health Care Agency's inspections are conducted annually but more frequent inspections may be conducted to verify abatement of previously noted violations or in response to complaints received by Orange County Health Care Agency.

6. What do the annual fees cover? How are the fees determined?

The annual fees cover the costs of our hazardous waste inspection program. Section 101325 (formerly §510) of the California Health & Safety Code allows the County to establish fees to cover necessary and reasonable costs of their programs. The fee process receives input from local businesses and is audited before fee rates are determined.

7. Where can I find a list of hazardous waste haulers?

The most comprehensive list of hazardous waste haulers for your area is located in the Business-to-Business Telephone Directory under the heading "Industrial Waste Haulers." If you have questions regarding their certification, please contact our office at (714) 667-3600.

8. What kind of paperwork do I need to keep onsite?

At a minimum the following paperwork or copies thereof must be kept onsite for this Agency's inspection:

- a. All hazardous waste disposal receipts and manifests for the past three years.
- b. The current contingency plan.
- c. All personnel training records of current employees must be kept until business closure. (Records of terminated employees must be kept for three years after the employee's termination date.)
- d. Waste analysis and or profiles. (Keep this paperwork onsite until the process changes or a new analysis is conducted.)
- e. This Agency's inspection reports for the past three years.
- f. All Material Safety Data Sheets (MSDS) for products used onsite.
- g. A copy of your EPA ID number (if applicable).

9. I am closing my shop. What do I need to do?

Prior to closure, contact the Hazardous Waste Specialist who inspects your business for closure details. At a minimum, before the final walk-through inspection, all hazardous wastes must have been properly disposed with receipts available for review, and the site cleaned to a “move-in” status.

The owners or operators of a business that generated hazardous waste must close their place of business in a way to make sure that further maintenance is not necessary and that human health and the environment is protected. If your site remains contaminated with hazardous waste, a site plan, site assessment, post-closure care, etc., may be required.

# Chapter 7

# Self-Audit

## Introduction

The self-audit is one of the best tools to use to stay in compliance. The self-audit enables you to know what wastes are on your site, where the wastes come from, how long they have been there and how the wastes will be disposed. Remember, ***you are responsible for your hazardous waste*** from its creation to its disposal at the offsite facility, “***cradle-to-grave***”. Take a walk through your business with your eyes and mind open, copy and use the following audit checklist as a guideline, and you should be well on your way to staying in compliance.

After conducting the self-audit, review any noted deficiencies. Meet with the people involved to correct the deficiencies and set deadlines for completion. Set up a procedure to verify all the corrections have been made and you should be well prepared for your annual hazardous waste inspection.

Listed beside each audit question is a number which represents the chapter number where the related information and appropriate code sections may be located. The “Yes/No?” column quickly shows how well your business did and the “Comments” column is for any notes you may make during your audit.

If you have questions about the audit, please call us at (714) 667-3600 and ask to speak to the Hazardous Waste Specialist that inspects your business.

“Cradle-to-Grave”

# Self-Audit Checklist

*Directions: For every question, circle the appropriate answer and indicate any comments you may have. Use the information in this manual to correct any deficiencies. Note that this is not a regulatory document. It was developed for your confidential use and need not be shown to any regulatory agency. For added confidentiality, photocopy the checklist and perform your audit on the copy, which can then be filed separately from this manual.*

Audit Item	Y	N	Comments
------------	---	---	----------

## How is my Hazardous Waste Produced?

1. Can any of my hazardous waste be used as a material onsite?  
(Chapter 1) ..... Y .... N ....
2. Can any of my processes use another material which would not  
create a hazardous waste? (Chapter 4) ..... Y .... N ....
3. Is there a way to produce less waste? For example, ask for parts  
to be shipped clean, reducing solvent usage. (Chapter 4) ..... Y .... N ....
4. Can any of my wastes be recycled offsite rather than  
landfilled? (Chapter 1) ..... Y .... N ....
5. Have I determined if my wastes are hazardous, i.e., toxic, reactive,  
ignitable or corrosive? (Chapter 1) ..... Y .... N ....

## Hazardous Waste Storage Area

1. Are all containers in good condition? No leaks? (Chapter 2) ..... Y .... N ....
2. Is all waste stored in a compatible container? (Chapter 2) ..... Y .... N ....
3. Are all containers stored closed? Bungs, lids on? (Chapter 2) ..... Y .... N ....
4. Are the containers properly labeled with all required information?  
(Chapter 2) ..... Y .... N ....
5. Do all labels show what is actually in the container? (Chapter 2) ..... Y .... N ....
6. Are incompatible wastes separated? (Chapter 2) ..... Y .... N ....
7. Does the waste storage area have an impermeable floor?  
(Chapter 2) ..... Y .... N ....
8. Is the waste storage area covered?  
(Not required by this Agency.) (Chapter 2) ..... Y .... N ....
9. Is there enough aisle space between all containers?  
(Chapter 2) ..... Y .... N ....

## Disposal

1. Does my facility need an EPA ID number? (Chapter 3) ..... Y .... N ....
2. Does my facility have an EPA ID number? (Chapter 3) ..... Y .... N ....
3. Are any wastes stored beyond their storage time(s)? (Chapter 3) ..... Y .... N ....

Audit Item	Y	N	Comments
4. Are all of my receipts and hazardous waste manifests: (Chapter 3)			
a. Correctly completed? .....	Y ....	N ....	
b. Signed by the TSD? .....	Y ....	N ....	
c. In a file available for review? .....	Y ....	N ....	
5. Has a copy of the manifest been sent to DTSC within 30 days of disposal? (This copy is blue on the California Hazardous Waste Manifest.) (Chapter 3) .....	Y ....	N ....	
6. Do I use a licensed hazardous waste hauler to dispose of my waste? (Chapter 3) .....	Y ....	N ....	
7. Is my waste taken to a permitted treatment/recycling facility? (Chapter 3) .....	Y ....	N ....	
8. Did my facility generate greater than 1,000 kg of hazardous waste in one month during the last calendar year? (Chapter 3) .....	Y ....	N ....	
a. If yes, did I submit a Biennial Report to DTSC? .....	Y ....	N ....	

## Training

1. Have I provided hazardous substance training for my employees within six months of hiring? (Chapter 5) .....	Y ....	N ....	
2. Do employees know how to use safety and emergency equipment? (Chapter 5) .....	Y ....	N ....	
3. Are the employees familiar with the contingency plan? (Chapter 5) ....	Y ....	N ....	
4. Do the employees know who to contact in case of an emergency? (Chapter 5) .....	Y ....	N ....	
5. Do I have available a list of emergency contacts and phone numbers? (Chapter 5) .....	Y ....	N ....	
6. Are my training records onsite? (Chapter 5) .....	Y ....	N ....	
7. Are my training records complete? (Chapter 5) .....	Y ....	N ....	





# Appendix A

## Where to Obtain the Laws & Regulations

Copies of laws and regulations may be ordered from the sources listed below. In addition, some bookstores sell copies of the laws and regulations. Check your local telephone directory under book or booksellers.

The California Health and Safety Code, Division 20, Chapter 6.5 may be ordered from:

**Department of General Services**  
**Publications Office**  
**P.O. Box 1015**  
**North Highlands, CA 95660**  
**(916) 574-2200**

The California Code of Regulations, Title 22, Division 4.5, may be ordered from:

**Barclays Law Publishers**  
**P.O. Box 3066**  
**South San Francisco, CA 94083**  
**Customer service and ordering information (800) 888-3600**

# Appendix B

## Local Law Library Locations

The following local libraries have copies of the California Health and Safety Code, Division 20, Chapter 6.5, and the California Code of Regulations, Title 22, Division 4.5, available to review.

**Orange County Law Library**

**515 North Flower Street**

**Santa Ana, CA 92703**

**(714) 834-3397**

**University of California, Irvine**

**Main Library**

**Government Publications Department**

**Irvine, CA 92714**

**(714) 824-7234**

**California State University, Fullerton**

**Reference Library**

**800 North State College Avenue**

**Fullerton, CA 92631**

**(714) 773-3449**

# Appendix C

## Hazardous Waste Determination Using STLC & TTLC

### A Classic Example

An auto body shop repairs vehicles and paints them in their paint booth. They have filters installed over the exhaust system to capture paint particulates. Paint that adheres to the filters dries but may be shaken loose, creating friable (powdery) paint dust. Since paint often contains heavy metals, used paint filters and paint dust may contain them as well. The body shop must determine whether the paint filters can be classified as hazardous waste. If determined to be hazardous waste, then the used filters must be handled, stored, transported, and disposed properly. How do they proceed?

Their first step is to take a representative sample of a used paint filter to a State-certified analytical laboratory. The lab takes a sample from the filter and analyzes it with the TTLC test to document the presence and concentration of heavy metals. To determine if the filter is a hazardous waste, the values measured by the lab would be compared to the STLC and TTLC values for regulated heavy metals (see page C-3). Note that this procedure is explained in more detail in Chapter 1.

Let's suppose that the lab results revealed the following metals and concentrations (measured in milligrams per kilogram or mg/kg). Their STLC and TTLC values are also presented.

Metal	Filter	STLC	TTLC
Cadmium .....	216 .....	1.0 .....	100
Molybdenum .....	6,120 .....	350 .....	3,500
Zinc .....	210 .....	250 .....	5,000

#### a. Cadmium.

The value of 216 mg/kg for Cadmium exceeds both the STLC and the TTLC. On this basis alone, *the filter is a hazardous waste*.

*A **representative sample** means a sample of a whole, which can be expected to exhibit the average properties of the whole.*

**b. Molybdenum.**

The value of 6,120 mg/kg for Molybdenum is below the TTLC, but above the STLC. Time for a little math! Multiply the STLC value for Molybdenum by 10; this yields 3,500 (350 times 10 = 3,500). If the filter's value for Molybdenum is less than that number, then it can be assumed to be nonhazardous. If the filter's value for Molybdenum is greater than that number, then it can be assumed to be hazardous or it can be subjected to further testing. Since the filter (6,120) is greater than (3,500), it can be assumed to be hazardous or it can be subjected to further testing.

If further testing is undertaken (that's the WET test - see Chapter 1) and the filter's concentration of Molybdenum is found to be equal to or greater than the STLC, then the filter is hazardous. Less than the STLC means that it's nonhazardous. Let's suppose that the WET test revealed a Molybdenum concentration of 618 mg/l. Since this value is greater than the STLC (618 is greater than 350), *the filter is a hazardous waste.*

**3. Zinc.**

The value of 210 mg/kg for Zinc is below both the STLC and the TTLC. This compound does not exceed any regulatory levels and, therefore, does not add to the toxicity of the sample.

**Conclusion**

In our example, the paint booth filter was determined to be a hazardous waste because of its Cadmium and Molybdenum concentrations. The used filters must be handled, stored, transported, and disposed properly.

For assistance with hazardous waste determination, call us at (714) 667-3600 and ask to speak with the Hazardous Waste Specialist that inspects your business.

## Listings of STLC and TTLC values for regulated heavy metals

Substance	STLC <sup>°°</sup> (mg/l)	TTLC <sup>°</sup> (mg/kg)
Antimony and/or antimony compounds .....	15 .....	500
Arsenic and/or arsenic compounds.....	50 .....	500
Asbestos(as percent) .....		1.0*
Barium and/or barium compounds (excluding barite).....	100 .....	10,000**
Beryllium and/or beryllium compounds.....	0.75 .....	75
Cadmium and/or cadmium compounds .....	1.0 .....	100
Chromium (VI) compounds .....	5 .....	500
Chromium and/or chromium(III) compounds .....	5*** .....	2,500
Cobalt and/or cobalt compounds.....	80 .....	8,000
Copper and/or copper compounds.....	25 .....	2,500
Fluoride salts .....	180 .....	18,000
Lead and/or lead compounds .....	5 .....	1,000
Mercury and/or mercury compounds .....	0.2 .....	20
Molybdenum and/or molybdenum compounds .....	350 .....	3,500
Nickel and/or nickel compounds .....	20 .....	2,000
Selenium and/or selenium compounds.....	1.0 .....	100
Silver and/or silver compounds .....	5 .....	500
Thallium and/or thallium compounds .....	7.0 .....	700
Vanadium and/or vanadium compounds.....	24 .....	2,400
Zinc and/or zinc compounds .....	250 .....	5,000

\*In the case of asbestos and elemental metals, the specified concentration limits apply only if the substances are in a friable, powdered or finely divided state. Asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

\*\*Excluding barium sulfate.

\*\*\*If the soluble chromium, as determined by the TCLP set forth in Appendix I of Chapter 18 of this division (22 CCR, §66261.24) is less than 5 mg/l, and the soluble chromium, as determined by the procedures set forth in Appendix II of Chapter 11 (CCR, §66261.24) equals or exceeds 560 mg/l and the waste is not otherwise identified as a RCRA hazardous waste pursuant to §66261.100, then the waste is a non-RCRA hazardous waste.

<sup>°</sup>TTLC lab results that are **greater than** the TTLC concentrations listed above are hazardous waste (HW). TTLC lab results that fall between the TTLC and STLC concentrations and are at least 10 times greater than the STLC concentrations must have the STLC test run.

<sup>°°</sup>STLC lab results that are **greater than** the STLC concentrations listed above are HW. TTLC or STLC lab results that are **less than the STLC** concentrations are not HW.

# Appendix D

## Consolidation

Hazardous waste may be consolidated by one of two methods.

### Consolidation of excluded recyclable non-RCRA hazardous wastes

(H&SC §§25143.2 (d) (3) & 25143.2 (d)(4))

Recyclable non-RCRA hazardous wastes may be consolidated to another location. The excluded recyclable non-RCRA hazardous wastes must be within 90 days:

1. Recycled onsite in one of the onsite processes, or
2. Hauled by a registered hazardous waste transporter to a permitted recycling facility.

Additionally, the following requirements must be met:

1. The material is transferred by employees in company vehicles.
2. The material is taken directly to the consolidation location.
3. No stops of more than 4 hours are made between locations.
4. The material is managed in compliance with hazardous waste laws at all times.
5. All of the following information is kept in an operating log at the last company location operated:
  - a. The name address of each location providing material to each shipment received.
  - b. The amount and type of material received from each location.
  - c. The destination and intended disposition of all material shipped offsite or received.
  - d. The date of each shipment received or sent offsite to be recycled.
6. Within 15 days of a request, the generator must provide documentation to show that the above listed requirements have been satisfied.

## Consolidation of Hazardous Wastes

(22 CCR§66263.45)\*

Hazardous wastes can be consolidated to a central site as long as:

1. The remote location generates less than 100 kg/month of hazardous wastes.
2. The generator uses a shipping paper to transport the waste to the central site.
3. The waste is disposed from the central site within 10 days of consolidation by a licensed hazardous waste transporter and is taken to a permitted treatment facility.

*\* All non-RCRA wastes may be consolidated under this provision. However, the wastes must leave the consolidation location in 10 days after initial accumulation.*

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# Appendix E

## Contingency Plan

### Directions for Completing the Contingency Plan

1. Fill out your business name, address, telephone, and fax.
2. Describe what your employees will do in response to fires, explosions, or releases of hazardous wastes.
3. List communications equipment such as alarms, phones and radios.
4. Indicate your designated, qualified emergency coordinators.
5. Identify emergency equipment such as fire extinguishers, alarms, and spill control devices.
6. State Office of Emergency Services can be reached at 1-800-852-7550 or 1-916-427-4341.
7. List the name, address, and phone numbers of your local police department, fire department, hospitals, and hazardous waste contractors.
8. Attach the following documents:
  - A. A detailed plot plan indicating facility layout, types of wastes handled and area stored, location of employees and Hazardous Waste Emergency Procedures for spills.
  - B. An evacuation plan indicating entrances and evacuation routes and possible alternate routes.
  - C. Copies of training records for all employees handling hazardous waste. Minimum information required:
    - 1) Name of employee working at job.
    - 2) Description of training given to each person.
    - 3) Written documentation of employees attendance at training.
9. Keep records for three years after employee leaves.
10. Annual training required.
11. Trained by a person experienced in hazardous waste management procedures.



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# Hazardous Waste Contingency Plan

## 1. Facility Information

Facility Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

## 2. Employee Responses to Emergencies:

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## 3. Type of Communication System:

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## 4. Emergency Coordinator, Primary:

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

## Emergency Coordinator, Alternate:

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

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**5. Emergency Equipment**

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**6. State Office of Emergency Services: 1-800-852-7550 or 1-916-427-4341**

**7. Emergency Contacts:**

***A. Police Department:***

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: **911 or** \_\_\_\_\_ Fax: \_\_\_\_\_

***B. Fire Department:***

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: **911 or** \_\_\_\_\_ Fax: \_\_\_\_\_

***C. Hospital:***

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

***D. Hazardous Waste Contractors:***

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

**8. Attach the following (check when completed):**

- A. Facility plot plan ..... **o**
- B. Evacuation plan ..... **o**
- C. Employee training records ..... **o**

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# Appendix F

## Glossary

### Bioaccumulative

**Toxic Substance** ..... A toxic substance that concentrates in living organisms when absorbed by living organisms.

**22 CCR** ..... Title 22 of the California Code of Regulations. State regulations that detail hazardous waste management.

**40 CFR** ..... Title 40 of the Code of Federal Regulations. Federal regulations that detail hazardous waste management.

**Cal/OSHA** ..... California Occupational Safety and Health Agency. State agency responsible for ensuring safe working environment.

**CAL/EPA** ..... California Environmental Protection Agency. State Agency responsible for enforcing environmental protection laws.

**Container** ..... Any portable device used to contain material or waste.

**Contingency Plan** .... A document that sets out an organized, planned and coordinated course of action to be followed in case of fire, explosion or release of hazardous waste or byproducts which could threaten human health or the environment.

**Corrosive** ..... The ability to cause destruction of living tissue or steel surfaces by chemical action.

**DOT** ..... Department of Transportation. Federal agency responsible for ensuring transportation safety.

**DTSC** ..... Department of Toxic Substance Control. State agency responsible for regulating all hazardous waste.

### Extremely

**Hazardous Waste**..... Any hazardous waste which, if human exposure should occur, may likely cause death or serious illness.

**Fine Powder** ..... Dry solid metal with a particle size smaller than 100 micrometers (0.004 inches) in diameter.

**Generator** ..... Any person whose act or process produces a hazardous waste.

**H&SC** ..... California Health and Safety Code. Portion of State law that governs health and safety issues. In this

manual, we are generally referring to Chapter 6.5 of the H&SC, which governs hazardous waste.

**Hauler** ..... *see Transporter.*

**Hazardous Waste**..... Any waste which is either Ignitable, Corrosive, Reactive, or Toxic.

**Ignitable** ..... Capable of being set afire either spontaneously or by interaction with another substance.

**LC-50**..... Lethal Concentration. The 50% mortality level of a test organism when the exposure route is by inhalation or in water.

**LD-50**..... Lethal Dose. The 50% mortality level of a test organism when the exposure route is by ingestion or skin absorption.

**LDR** ..... Land Disposal Restriction. Regulations which prohibit land disposal of certain hazardous waste.

**Land Disposal**..... Placement in or on the land.

**MSDS** ..... Material Safety Data Sheet. A document which describes a material's chemical ingredients as required by Cal/OSHA's Hazard Communication Standard.

#### **NON-RCRA**

**Waste** ..... California-regulated hazardous waste. Also called California-only waste. (Compare with RCRA Waste).

**OCHCA** ..... Orange County Health Care Agency. Environmental Health is a Division within this organization.

**RCRA** ..... Resource Conservation Recovery Act. Federal law passed in 1976 which regulates the management and disposal of hazardous wastes throughout the United States. State laws, however, can impose stricter requirements.

**Reactive** ..... Having properties of explosivity or of chemical reactivity which are a hazard to human health or the environment.

**Reclaimed** ..... A process that recovered usable product or regenerated the material.

#### **Recyclable**

**Material** ..... A material which is not treated and can be used as a safe effective substitute for virgin materials.

**Sieve Test** ..... Determines the particle size of scrap metal. Only scrap metal with a particle size greater than 0.004 inches is recyclable.

**STLC** ..... Soluble Threshold Limit Concentration. An analyti-

cal test used to describe the soluble heavy metals content of a sample.

- TCLP** ..... Toxicity Characteristic Leaching Procedure. An analytical test which determines if certain metals and organics are present in the waste.
- TSDF** ..... Treatment Storage Disposal Facility. Permitted facility which either treats, stores or disposes hazardous waste.
- TTLC** ..... Total Threshold Leaching Concentration. Describes total heavy metals content.
- Tank** ..... Any permanent immobile device used to contain material or waste.
- Toxic Waste** ..... A designated hazardous waste by the U.S. EPA Administrator.
- Transporter** ..... A person engaged in the offsite transportation of hazardous waste by highway, air, rail or water.
- WET** ..... Waste Extraction Test. Testing procedure which measures the amount of California regulated bioaccumulative and persistent substances—heavy metals.

# Appendix G

## Publications List

The following is a list of publications available from the State of California. All reports are available at no cost to businesses, individuals, and government agencies throughout California. Videos are appropriately priced. Current and obsolete publications are available as references at the California Department of Toxic Substances Control (DTSC) Library and at select California Repository libraries. Order reports by calling (916) 322-3670 or writing to the Department of Toxic Substances Control, Office of Pollution Prevention and Technology Development, Technology Clearinghouse, P.O. Box 806, Sacramento, CA 95812-0806. The fax numbers are (916) 327-4494 and (916) 445-2939. Some documents are also available on the DTSC Home Pages on the World Wide Web. The URL is <http://www.calepa.cahwnet.gov/dtsc>.

### Hazardous Waste Source Reduction and Management Review Act (SB 14)

The preferred approach to waste minimization is source reduction. Source reduction is any activity that prevents or reduces the generation of hazardous waste; it does not mean reducing the volume or toxicity of an already generated waste.

#### Order # Title

- |     |  |
|-----|--|
| 001 | Guidance Manual for the Hazardous Waste Source Reduction and Management Review Act of 1989 (Includes Appendices) (1993, 159 pp.)<br>The Source Reduction Act requires generators to examine current hazardous waste generating processes for hazardous waste minimization opportunities and create a plan to implement workable alternatives. Generators of hazardous waste in excess of amounts specified in the Act must prepare a Source Reduction Evaluation Review and Plan, a Hazardous Waste Management Performance Report, and a Progress Report according to a fixed time schedule. |
| 002 | SB 14 Update (1993, 3 pp.)<br>Informs readers of the latest changes affecting the implementation of the Hazardous Waste Source Reduction and Management Review Act of 1989. This issue discusses the availability of new regulations, future planning document call-ins, additional uses of source reduction planning, and the results from last year's survey.  |
| 003 | Changes for 1993 to the Hazardous Waste Source Reduction and Management Review Act of 1989 (1993, 2 pp.)<br>This brochure summarizes the requirements for a  |

generator who is subject to the Act. Included is information about the amendments proposed by Senate Bill 1726 adopted by Statutes of 1992 as Chapter 853.

- |     |  |
|-----|--|
| 004 | Hazardous Waste Source Reduction Compliance Checklist (1993, 21 pp.) |
|-----|--|

SB 1726 amends SB 14 and required the Department to develop a compliance checklist as a substitute format for the Source Reduction Evaluation Review and Plan. The Compliance Checklist can be used by generators and small businesses who are newly captured under SB 1726.

### Waste Minimization Fact Sheets

A summary of waste minimization methods for specific industries.

#### Order # Title

- |     |   |
|-----|---|
| 101 | PCB Handling, Treatment, and Disposal (1992, 6 pp.)   |
| 200 | Waste Minimization Can Work for You (1992, 4 pp.)<br>A summary of general hazardous waste minimization definitions and techniques for businesses. |
| 201 | Aerospace Industry (1992, 4 pp.)  |
| 202 | Automotive Paint Shops (1992, 4 pp.)  |
| 203 | Automotive Repair Shops (1989, 4 pp.)   |
| 204 | Building Construction (1992, 4 pp.)   |
| 205 | Commercial Printing Industry (1992, 4 pp.)  |
| 206 | Metal Finishers (1991, 4 pp.)   |
| 207 | Paint Formulators (1992, 4 pp.)   |
| 208 | Pesticide Formulating Industry (1992, 4 pp.)  |
| 209 | Printed Circuit Board Manufacturers (1992, 4 pp.)   |
| 210 | Decorative Plating with Trivalent Chrome (1992, 6 pp.)  |
| 211 | Research and Educational Institutions (1993, 4 pp.)   |
| 212 | Ceramic Products (1993, 4 pp.)  |
| 213 | Drug Manufacturing and Processing (1994, 6 pp.)   |
| 214 | Jewelry Manufacturing Industry (1995, 6 pp.)  |

### Waste Audit Studies

Full scale assessments of specific industries that show where waste minimization methods can be most effective.

#### Order # Title

- |     |   |
|-----|---|
| 301 | Automotive Repairs (1987, 69 pp.)   |
| 303 | Commercial Printing Industry (1989, 137 pp.)  |
| 304 | Drug Manufacturing and Processing Industry (1989, 224 pp.)                                |
| 305 | Fabricated Metal Products Industry (1989, 188 pp.)  |
| 306 | Fiberglass-Reinforced and Composite Plastic Products (1989, 164 pp.)                      |
| 307 | General Medical and Surgical Hospitals (1988, 182 pp.)                                    |
| 308 | Gold, Silver, Platinum, and Other Precious Metals Product and Reclamation (1990, 198 pp.) |
| 309 | Marineyards for Maintenance and Repair (1989, 156 pp.)                                    |
| 310 | Mechanical Equipment Repair Shops (Includes Addendum) (1990, 87 pp.)                      |
| 311 | Metal Finishing Industry (Includes Addendum) (1988, 236 pp.)                              |
| 312 | Nonagricultural Pesticide Application Industry (1991, 116 pp.)                            |
| 314 | Pesticide Formulating Industry (1987, 160 pp.)  |

- 316 Printed Circuit Board Manufacturers (1989, 234 pp.)  
 317 Research and Educational Institutions (1988, 144 pp.)  
 318 Stone, Clay, Glass, and Concrete Products Industries (1991, 120 pp.)  
 319 Thermal Metal Working Industry (1990, 195 pp.)

## Hazardous Waste Minimization Checklist and Assessment Manuals

Assessment manuals developed to aid manufacturers in evaluating their shops for waste minimization opportunities.

### Order # Title

- 400 Automotive Repair Shops (1988, 47 pp.)  
 402 Metal Finishing Industry (1993, 143 pp.)  
 403 Paint Formulators (1991, 40 pp.)  
 404 Pesticide Formulators (1990, 20 pp.)  
 405 Printed Circuit Board Manufacturers (1991, 31 pp.)  
 406 Auto Paint Shops (1992, 12 pp.)  
 407 Building Construction (1992, 28 pp.)  
 408 Ceramic Products (1993, 27 pp.)  
 409 Marine Ship and Pleasure Vessel Boat Yards (1993, 30 pp.)  
 410 Jewelry Manufacturers (1994, 43 pp.)  
 411 Commercial Printing Industry (1994, 54 pp.)  
 412 Photoprocessing Industry (1995, 66 pp.)

## Waste Minimization Assessments of Specific Facilities

### Order # Title

- 504 Pollution Prevention Technologies at General Dynamics—Pomona, California (1991, 9 pp.)  
 A variety of waste minimization technologies were technically and economically evaluated at an aerospace facility. Technologies range from computerized printed circuit board plating to solvent distillation.  
 522 Waste Reduction Strategies for the Printed Circuit Board Industry (1987, 115 pp.)  
 An assessment of the feasibility of achieving significant reductions of hazardous waste generated by the printed circuit board industry.  
 516 Reduction of Solvent Wastes in the Electronics Industry (1988, 85 pp.)  
 Hewlett Packard's San Jose facility was used as a model to study the techniques required to reduce the volume and type of organic solvent wastes in the electronics industry. Up to a 70% reduction in organic solvent waste volume at the facility could be realized, thus saving the company up to \$414,000 per year in disposal and chemical purchase costs.  
 502 Disposal of Heavy Metal Waste Sludges in Ceramic Products (1990, 103 pp.)  
 A laboratory-scale test to determine the feasibility of incorporating heavy metal sludges into manufacturing ceramic products. The process can be economical and is technically sound.  
 519 Pollution Prevention Assessment of the Office of the State Printer (1991, 42 pp.)  
 Provides the findings of a pollution prevention assessment of the State Printing Plant and can serve as a waste

- minimization guideline for printers in California.  
 521 Waste Minimization: Small Quantity Generators at Los Angeles International Airport (1990, 49 pp.)  
 Summarizes the results of a study that involved visits to five representative small quantity generators and targeted waste minimization of used oil and jet fuel, cleaning operations, and paint stripping.  
 528 Assessment of the Aerospace Industry Facility Planning Efforts (1993, 100 pp.)  
 This report presents the results of the Department's assessment of the aerospace industry's source reduction review and planning effort as mandated under the Hazardous Waste Source Reduction and Management Review Act of 1989 (SB 14). The report discusses the review of about 90 facility summaries and 22 entire plans and reports.  
 529 Assessment of the Petroleum Industry Facility Planning Efforts (1993, 100 pp.)  
 This report presents the results of the Department's assessment of the petroleum industry's source reduction review and planning effort mandated by the Hazardous Waste Source Reduction and Management Review Act of 1989 (SB 14). The report discusses the source reduction review of approximately 18 petroleum industry facilities.  
 530 Assessment of the Semiconductor Industry Source Reduction Planning Efforts (1994, 85 pp.)  
 Presents the results of the Department's assessment of the semiconductor industry's source reduction review and planning effort as mandated under the Hazardous Waste Source Reduction and Management Review Act of 1989.

- 531 Assessment of California 1,1,1-Trichloroethane Users Source Reduction Efforts (1995, 125 pp.)  
 More than forty different companies representing over thirty different industries submitted source reduction documents with 1,1,1-trichloroethane substitution information. Thirty-five abstracts explain how these companies are making the transition to other cleaners. Document call-in and review conducted under authority of SB 14.  
 532 Assessment of Selected Paints and Allied Product Manufacturers Source Reduction Facility Planning Efforts (1995, 37 pp.)  
 Summarizes the results of the Department's assessment of the paint manufacturing industry's source reduction and facility planning efforts. The Department requested and reviewed Plans and Reports from 26 facilities within this SIC code (2851).  
 533 Assessment of the Polymers and Resins Industry Hazardous Waste Source Reduction planning Efforts (1996, 75 pp.)  
 Presents the results of the Department's assessment of the polymers and resins industry's source reduction and facility planning effort as mandated under the Hazardous Waste Source Reduction and Management Review Act of 1989. The Department requested and reviewed Plans and Reports from 31 facilities.

## Waste Stream Specific Information

### Order # Title

- 511 Metal Waste Management Alternatives—1989 Symposium Proceedings (1989, 252 pp.)  
 Contains papers delivered at two symposia in September 1989. The papers discuss metal waste disposal

- restrictions and alternatives to disposal such as waste prevention and current recycling technologies.
- 513 Reducing California's Metal-Bearing Waste Streams (1989, 174 pp.)  
Analyzes alternatives to land disposal of California's hazardous metal waste streams and focuses on methods that prevent waste generation. Source reduction, recycling, and treatment strategies are examined.
- 604 Guide to Oil Waste Management Alternatives for Used Oil, Oily Wastewater, Oily Sludge, and Other Wastes Resulting from the Use of Oil Products—Final Report (1988, 220 pp.)  
Presents the results of a study of oil waste management alternatives. Includes regulations, established and emerging technologies, current practices, economics and environmental impacts of oil waste management.
- 606 Guide to Solvent Waste Reduction Alternatives—Final Report (1986, 222 pp.)  
Practical waste management alternatives to land disposal that have potential for reducing the amount and/or toxicity of solvent waste generated.
- 607 Aqueous Alternatives to Solvent Cleaning (1995, 6 pp.)  
A summary of general information on many of the aqueous alternatives available to replace solvent cleaners.
- 608 Alternatives to Chlorinated Solvents in Cleaning Applications (1994, 132 pp.)  
Discusses the chemical and process alternatives to chlorinated solvents in vapor degreasing, cold cleaning, printed circuit board defluxing, and handwipe operations. The report also summarizes the air, water, and waste regulations that apply to alternatives. Detailed case studies demonstrate the issues that firms must consider when they are selecting an alternative.
- 609 Simplified Guide for Evaluating Alternatives to Chlorinated Solvents in Cleaning Applications (1995, 22 pp.)  
Presents a simplified approach for evaluating alternatives to chlorinated solvents in various cleaning applications. This approach is based on a detailed cross-media analysis of the alternatives in vapor degreasing, cold cleaning, wipe cleaning, printed circuit board defluxing described in Document Number 608. Written by Dr. Katy Wolf of the Institute of Research and Technical Assistance (IRTA).
- 610 Compliance Assistance PCB Self-Inspection Checklist for PCB Waste Generators (1995, 8 pp.)  
A checklist designed to approximate one that an inspector might use while examining a facility for PCB compliance. Also provides regulatory references to assist in locating further information or regulations concerning specific issues or sections of the checklist. Both Federal and California PCB regulations are discussed.
- 611 Parts Cleaning Alternatives in Machine Shops (1995, 16 pp.)  
A guide to assist shop operators in the evaluation and adoption of alternatives to the use of 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113) and 1,1,1-trichloroethane (TCA) for parts cleaning. These two chlorinated solvents have been banned as of 1/1/96. The report is also a primer for those interested in pollution prevention strategies for machine shops.

## Local Government

- | Order # | Title   |
|---------|---|
| 527     | Marketing Pollution Prevention 101: A Simple Guide for Local Governments  |
| 507     | Hazardous Waste Reduction: A Step-by-Step Guidebook for California Cities (1992, 180 pp.)<br>Outlines the essential elements of a successful city-run, multimedia waste minimization program. It is designed to walk the user through the steps the city can take to implement and reduce hazardous materials use and hazardous waste typically generated by city operations. |
| 520     | Waste Minimization Opportunities for Selected City of Los Angeles Hazardous Waste Generating Operations (1990, 143 pp.)<br>Summarizes a joint effort between the City of Los Angeles and DTSC to identify and evaluate waste minimization opportunities for selected city operations.   |
| 514     | Reducing Industrial and Commercial Toxic Air Emissions by Minimizing Waste—The Role of Air Districts (1990, 120 pp.)<br>Designed to assist Air Pollution Control Districts in reducing toxic air emissions and explains how waste minimization results in lower toxic air emissions.  |

## Further Waste Minimization Information

- | Order # | Title   |
|---------|---|
| 505     | Hazardous Waste Minimization Bibliography (1991, 76 pp.)<br>References are organized in four sections: (1) general hazardous waste minimization topics, (2) industry-specific, (3) material-specific, and (4) available abstracts from the previous three sections. All references are listed in alphabetical order by title.   |
| 506     | Incinerable Hazardous Waste Minimization Project Fact Sheet (1992, 8 pp.)<br>Provides an interim update for the project using 1990 data taken from the manifest system.   |
| 508     | Incinerable Waste Minimization Workshops Proceedings (1991, 251 pp.)<br>A compilation of the papers presented at two workshops held in January 1991. Areas covered include: regulations, source reduction, recycling strategies and opportunities, alternative technologies for petroleum refineries, electronics industry, aerospace industry, and chemical and paint manufacturers.   |
| 510     | No-Waste Lab Manual for Educational Institutions (1991, 115 pp.)<br>A laboratory manual for introductory chemistry courses incorporating procedures that produce little or no toxic waste. This is accomplished by the use of consecutive chemical reactions so that the production of one reaction is used as the starting material for the next.  |
| 517     | Waste Minimization for Hazardous Materials Inspectors: Introductory Text with Self-Testing Exercises (Module I), Assessment Procedures (Module II, Unit 1), and Metal Finishing Industry (Module III) (1991, 182 pp.)<br>Module I is written for use by both experienced and novice hazardous materials inspectors who wish to learn more about hazardous waste minimization. Module II provides basic information in conducting a self-assessment, and Module III focuses on some of the viable waste minimization alternatives for certain metal finishing operations. (Videotape also available — See Order #1500) |



- 518 Waste Minimization Assessment Procedures: For the Generator (Module II, Unit 2) (1991, 81 pp.)  
Provides the hazardous waste generator with procedures for conducting a self-assessment and introduces the provisions of Senate Bill 14, the Hazardous Waste Source Reduction and Management Review Act of 1989.
- 525 Working With Small Businesses—A Case Study in Developing a Small Business Pollution Prevention Program (1993, 73 pp.)  
Developed by the City of Anaheim Public Utilities and Fire Departments and DTSC to assist small business owners and operators in dealing with a variety of environmental issues.
- 526 Pollution Prevention 1993 - A Year in Review (1994, 96 pp.)  
Documents the significant accomplishments and activities which have been achieved by the Department in the area of pollution prevention during calendar year 1993. The report highlights several very important projects which are being looked upon as national models.

## Grants

Findings of DTSC Grant Projects.

### Order # Title

- 1101 California Hazardous Waste Reduction Grant Program — Grant Application Manual (Updated Annually) (1994, 56 pp.)  
Provides information on how to submit a properly prepared application to the California Hazardous Waste Reduction Grant Program that is managed by the Office of Pollution Prevention and Technology Development.
- 1102 Hazardous Waste Reduction Technology Research, Development, and Demonstration Grant Program (1993, 1 p.)  
Brief description of the Grant Program. Fifteen to twenty grants are usually awarded each year.

## Biennial Reports to the California State Legislature

### Order # Title

- 1206 Alternative Technologies for Recycling and Treatment of Hazardous Wastes (Third Biennial) (1986, 186 pp.)  
It is a guide for hazardous waste generators seeking alternative waste management techniques and serves as a resource for the public and policy makers in government and industry. The technologies and economics described are critical considerations for the formulation of California's hazardous waste management policy.
- 1203 Economic Implications of Waste Reduction, Recycling, Treatment and Disposal of Hazardous Wastes (Fourth Biennial) (July 1988, 126 pp.)  
Reports on the cost/benefit of reducing hazardous waste in industry. Cost comparisons of site mitigation activities, industry waste minimization, and future liabilities of hazardous waste disposal are discussed.

- 1202 Alternative Technologies for the Minimization of Hazardous Waste (Fifth Biennial) (1990, 140 pp.)  
Reports on activities relating to innovative hazardous waste minimization, recycling, and treatment technologies.
- 501 Pollution Prevention in California—An Overview of California's Pollution Prevention Programs (Sixth Biennial) (1992, 110 pp.)  
An overview of California's multimedia pollution prevention programs at the State and local government levels. Industry pollution prevention case studies show how business responds to the pressure to reduce wastes.

## Alternative Technology

New and innovative alternative technologies.

### Order # Title

- 1200 Application of the Polysilicate Technology to Heavy Metal Wastestreams (1987, 33 pp.)  
The polysilicate treatment technology has been applied to a variety of waste streams containing heavy metals. It differs from conventional forms of solidification/fixation/stabilization by forming a metal metasilicate as a by-product. It is still semi-empirical in nature and requires further research.
- 1201 Final Report on CCBA (Coordinate Chemical Bonding Project) Phase III (1988, 24 pp.)  
The goal of this successful project was to demonstrate that when mixing industrial sludges containing metal ions with highly absorptive clay, in proper proportions and at elevated temperatures, the metal ions will fuse into the clay's silica structure and render the resulting material nonhazardous.
- 1204 Laboratory Scale Tests of the Circulating Bed Combustion of Spent Potliners—Final Report (Includes Project Summary) (1988, 76 pp.)  
Spent potliner (SPL) is a solid waste by-product of aluminum smelters that contains soluble species of cyanides and fluorides. The circulating bed combustor process treats SPL reducing both cyanide and leachable fluoride levels by specialized thermal treatment processes.
- 1207 UV/Hydrogen Peroxide Treatment for Destruction of Pesticide Laden Waste—Final Report (Includes Project Summary) (1987, 30 pp.)  
This system has been reported to be effective in degrading organic contaminants in water by a chemical oxidation process. The study focuses on the destruction of low level, aqueous pesticide wastes.
- 1208 UV/Ozone Treatment of Pesticides and Groundwaters (1988, 36 pp.)  
A discussion of a demonstration project using the Ultrox Ultraviolet light enhanced oxidation technique for a variety of organic contaminants including pesticides, halogenated compounds, phenols, benzene, and other aromatics.
- 1209 Composting for Treatment of Pesticide Rinseates — Final Report (Includes Project Summary) (1988, 63 pp.)  
This study tests the viability of aerobic composting as a treatment option for low level pesticide wastes previously stored in evaporation ponds or in a landfill.
- 1215 The Construction and Assessment of a Biological System for Biodegradation and Recycling of Pesticide Waste (1993, 57 pp.)  
Experimental results and data of a biologically based, electromechanical system that uses horse manure as a

- source of microbes to biodegrade pesticide waste.
- 1216 Pesticide Rinsates: Biodegradation Technology (Technology Brief) (1993, 4 pp.)  
Describes a biologically based, electromechanical system that uses horse manure as a source of microbes to biodegrade pesticide rinsates.
- 1210 Chlorinated Solvent Recovery from Groundwater Using Contaminated Ambersorb XE-340 Carbonaceous Resin Adsorbent — Final Report (Includes Project Summary) (1991, 7 pp.)  
Presents findings and conclusions of using Ambersorb XE-340 carbonaceous resin adsorbent to remove 1,1,1-trichloroethane (TCA) and trichloroethylene (TCE) from groundwater.
- 1211 Reclamation of Waste Foundry Sands: Fresno Valves and Castings, Inc. Waste Sand Reclamation Project (Technology Brief) (1992, 4 pp.)  
Describes a project involving the reconditioning and reuse of most of the waste sand.
- 1212 Alternative Technology Demonstration Project Report—Use of Kerr McGhee Chemical Corporation Boiler Fly Ash as a Feedstock in the Manufacturing of Southwestern Portland Cement.  
This project determined that the use of Kerr McGhee fly ash as an ingredient in the manufacture of Portland Cement resulted in a cement product that effectively stabilized hazardous levels of nickel and vanadium present in the ash ingredient.
- 1213 Alternative Technology Demonstration Project Report — Separation of Phosphor Powder, Glass and Endcaps to Enable Recycling of Spent Fluorescent Lamp Tubes (1993, 12 pp.)  
A full-scale demonstration of this effective system was conducted with Mercury Technologies, Incorporated.
- 1214 Water Based Ink Wastes: Biodegradation Technology (Technology Brief) (1993, 4 pp.)  
Describes a biologically based electromechanical system that uses horse manure as a source of microbes to biodegrade water based ink wastes.
- 1217 California Environmental Technologies and Services Directory (updated annually) (1993, 272 pp.)  
The Directory consists of an alphabetical listing of over 1,100 California environmental companies and a series of technology matrices giving detailed information about the company's involvement in the environmental industry. The Directory is also available for \$50 on disk. In order to receive a copy on disk, a "Purchase Order" form must be obtained by calling (916) 445-2927.
- Two pilot-scale demonstrations were conducted to evaluate the effectiveness of above-ground bioremediation of soil contaminated with a mixture of biphenyl and diphenyl oxide. The tests demonstrated that the addition of water and nutrients, and the tilling of the soil reduced the concentrations of the contaminants by about 50-60 percent with or without the addition of exogenous bacteria.
- 1303 Biological Remediation of a Fuel Contaminated Soil Site in Carson, California—Protek Environmental, Inc. (1990, 7 pp.)  
Diesel fuel-contaminated soil was biologically treated above ground in treatment cells. Total petroleum hydrocarbons were reduced from 1,084 mg/kg to 2 mg/kg in 90 days in the treatment cells. Similar removal occurred in the control cell.
- 1304 Bioremediation of Used Oil-Contaminated Soil at Two Caltrans Maintenance Yards—Groundwater Technology Corporation (1990, 10 pp.)  
Provides results for full-scale bioremediation at two sites. At one site, a single pile was treated with an aqueous nutrient solution and passive aeration. At the second site, one pile was treated with an aqueous nutrient solution and active aeration while a second pile was used as a control. All piles showed some removal of hydrocarbons.
- 1320 Field Tests for Trinitrotoluene (TNT) Contaminated Soil - Hercules, California (1991, 31 pp.)  
A pilot-scale study was conducted to determine whether aerobic biological treatment processes could reduce concentrations of trinitrotoluene (TNT), dinitrotoluene (DNT), and dinitrobenzene (DNB) in soil. Two processes were investigated. One uses cultured indigenous bacteria, and the other uses a proprietary mulching agent. The estimated time required to achieve the established cleanup levels is in excess of 1518 days using cultured indigenous bacteria and in excess of 833 days using mulching agents.
- 1321 Biological Treatment - Field Tests for Pesticide Contaminated Soil - Harmond Field (1991, 25 pp.)  
Bench-scale tests were conducted to determine and select the best bacterial additive or conditions for remediating the pesticide contaminated soils at the Harmon Field site in Tulare County, California. Results from the tests indicated that the removal of pesticides in the test containers after 192 days of treatment were not achieved, and it is not clear if organochlorine pesticide concentrations have decreased at all.

#### Chemical

- 1305 Chemical Reduction of Hexavalent Chromium Contaminated Soils for a Site in Bakersfield, California (1991, 6 pp.)  
Full-scale tests were conducted to determine the effectiveness of a chemical reduction process to treat hexavalent chromium-contaminated soils. The process was successful at reducing the concentration levels of hexavalent chromium by an average of 95.8 %.
- 1306 Hydrogen Peroxide/Catalyst Oxidation Process from a Gasoline Contaminated Site in Fullerton, California — Ensotech, Inc. (1990, 20 pp.)  
Full-scale field tests were conducted to evaluate the effectiveness of Ensotech, Inc.'s hydrogen peroxide/catalyst process to treat soil contaminated with gasoline from a leaking underground fuel tank. Test results show significant reductions in gasoline concentrations in soil but no significant difference between the Ensotech process and the control.

## Remedial Technology Demonstration Reports

Independent technical evaluations of new, innovative, hazardous waste remedial technologies. Reports include details of bench-, plot-, or full-scale demonstration projects. The findings result in a Department conclusion regarding the project feasibility and provide the technical basis for any future permits for commercial operation. Reports are grouped by type of treatment.

### Order # Title

#### Biological

- 1300 Above-Ground Bioremediation of Biphenyl and Diphenyl Oxide Contaminated Soil (1991, 8 pp.)

## Physical

- 1313 Soil Washing Technology for Low Volatility Petroleum Hydrocarbons—Verl's Construction Company (1990, 6 pp.)  
A full-scale field demonstration of a portable soil washing system owned and operated by Verl's Construction Company was conducted at the Peterson Tractor site in San Leandro, California. Removal efficiencies of oil and grease as high as 71% were measured during a single pass through the washer.

## Stabilization

- 1302 Bench-Scale Demonstration of a Metal Stabilization Process for a Site in Commerce, California — Silicate Technology Corporation (1990, 8 pp.)  
Bench-scale tests were conducted to evaluate the effectiveness of Silicate Technology Corporation's process to stabilize soluble metals in lead contaminated soil from a hazardous waste site. The treated soils showed significant reductions in soluble lead concentrations.
- 1307 Metal Stabilization Process for Municipal Waste-To-Energy Ash — Lassen College (1990, 15 pp.)  
A three-part demonstration was conducted to evaluate the effectiveness of a sodium silicate/cement-based process used to stabilize heavy metal contaminated fly and bottom ash generated by a municipal solid waste-to-energy cogeneration facility. Results show the process has the potential to reduce soluble heavy metal concentration to below the California regulatory limits.
- 1308 Portland Cement Stabilization Process for Lead-Contaminated Soil (1991, 7 pp.)  
Six cubic-foot batches of lead-contaminated soil were treated with differing ratios of Portland Cement. Average soluble lead concentrations were significantly reduced.
- 1310 Silicate Stabilization Process for Heavy Metal Contaminated Soil at the Tamco Steel Site—Solids Treatment Systems, Inc. (1990, 7 pp.)  
A full-scale demonstration of a silicate stabilization process was conducted. Soil contaminated with lead, zinc, and cadmium were treated by the Trezek or Lopat process. All leachable metal concentrations were reduced to below their respective hazardous waste thresholds.
- 1314 A Stabilization Process for Soils Contaminated with Metals and Petroleum Hydrocarbons — Benz/Gabbita Consulting Services (1990, 10 pp.)  
Bench-scale demonstration tests evaluated the effectiveness of a stabilization process to treat lead and petroleum hydrocarbons in a soil matrix. The ability of the process to stabilize total petroleum hydrocarbons could not be confirmed.
- 1315 Sulfide Stabilization Technology for Copper-Contaminated Soil—Toxco Incorporated (1990, 7 pp.)  
Copper-contaminated soil was treated with a sulfide precipitation process that created reactive sulfides at levels that classified the treated soil as a RCRA waste. The pH was above the hazardous waste threshold of 12.5.

## Thermal

- 1311 Soil Cleanup System for a Diesel Contaminated Site in Kingvale, California—Earth Purification Engineering, Inc. (1990, 15 pp.)

Full-scale field tests were conducted to determine the effectiveness of Earth Purification Engineering Inc.'s Soil Cleanup System to treat diesel fuel contaminated soil and to estimate the level of stack air emissions from the treatment. The system was successful at removing the diesel contamination from the soil, but did not achieve good destruction of the diesel in the stack gases.

- 1312 Soil Detoxification Utilizing an Existing Aggregate Drier — South Coast Asphalt Products Company (1990, 3 pp.)  
Simple feasibility tests using an existing rotary drier at an asphalt batch plant were coordinated in 1986. Results of the demonstration indicated high gasoline removal but poor combustion of the gasoline vaporized from the soil.
- 1316 Thermal Treatment of Hydraulic Fluid Contaminated Soil (1991, 12 pp.)  
Tests were conducted to determine the effectiveness of U.S. Waste Thermal Processing's Mobile Thermal Processor, Model 100, to treat hydraulic fluid-contaminated soil and to measure the level of stack air emissions from the treatment. The Model 100 successfully removed hydraulic fluid from the soil and achieved good destruction and removal of the contaminants from the stack gases.
- 1318 Thermal Treatment Process for a Diesel- Contaminated Site in San Diego, California (1991, 14 pp.)  
A full-scale field test was conducted to determine the effectiveness of Earth Purification Engineering, Inc.'s Soil Cleanup System to treat diesel fuel-contaminated soil. The system successfully removed the diesel contamination from the soil to below the established cleanup level of 1,000 mg/kg.
- 1319 Thermal Treatment Process for Fuel Contaminated Soil — U.S. Waste Thermal Processing (1990, 30 pp.)  
Tests were conducted to determine the effectiveness of a mobile thermal processing unit to treat petroleum fuel contaminated soil. The tests were successfully performed on synthetically prepared gasoline and diesel contaminated soil.

## Other Remedial Technology Information

### Order # Title

- 1350 Remedial Technology Applications Matrix for Soils and Sludges (1991, 16 pp.)  
The Remedial Technology Applications Matrix was developed to identify treatment technologies applicable to treating contaminated soils and sludges that should be considered for hazardous waste site cleanup.

## Videos

### Source Reduction

#### Order # Title

- 1400 Hazardous Waste Minimization: Planning for Success (1991, 3 hours, 2 tapes) ..... \$25.00  
An interactive videoconference on SB 14: The Hazardous Waste Source Reduction and Management Act of 1989.

### Waste Minimization

#### Order # Title

- 1500 Waste Minimization for Inspectors (Videotape of a slide show) (1991, 44 minutes) ..... \$15.00  
A three-section videotape of a slide show that provides a basic introduction to waste minimization and assessment procedures, and an excellent overview of waste minimization processes involved in metal cleaning, metal finishing,

- 
- and printed circuit board manufacturing.
- 1501 Why Waste?: Waste Minimization for Today's Businesses (1990, 28 minutes)  
\$15.00  
Defines waste minimization and illustrates waste minimization successes in several different types of businesses. Source reduction and recycling case studies illustrate the environmental and economic benefits of implementing waste minimization programs. Is useful for training sessions and seminars focusing on innovative ways for reducing hazardous waste.
- 1502 The Surfer, the Garbageman, and the Lady in the Sky (1993, 15 minutes)  
\$15.00  
A videotape written, directed, and produced by high school students chronicles, from a student's perspective, a whimsical discussion of personal responsibilities relating to hazardous waste generation, resource conservation, and pollution prevention. The accompanying workbook, "Economics and the Environment: Teamed for Success," provides a guide to teachers for class discussions and assignments through a series of case studies, interviews, and research materials. This is accomplished through presentations on the economic and environmental pros/cons of certain personal and business decisions related to using hazardous materials, energy, and natural resources.

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